AD Series Digital Video Recorder
User's Manual

AD416
AD216
AD209
AD116
AD109
AD104

Before attempting to connect or operate this product, please read these instructions carefully and save this manual for future use.

CAUTION

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER.
NO USER SERVICEABLE PARTS INSIDE.
PLEASE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING

TO PREVENT FIRE OR ELECTRIC SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

NOTE: This equipment has been tested and found to comply with the limits for a Class "A" digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the users will be required to correct the interference at their own expense.

FCC Caution: To assure continued compliance, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This Class A digital apparatus meets all the requirements of the Canadian Interference Causing Equipment Regulations.

CE

LIMITATION OF LIABILITY

- This publication is provided “as is” without warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for any particular purpose, or non-infringement of the third party’s right.

- This publication could include technical inaccuracies or typographical errors. Changes are added to the information herein, at any time, for the improvements of this publication and/or the corresponding product(s).

DISCLAIMER OF WARRANTY

In no event shall the supplier be liable to any party or any person, except for replacement or reasonable maintenance of the product, for the cases, including but not limited to the followings:

- Any damage or loss, including but without limitation, direct or indirect, special, consequential or exemplary, arising out of or relating to the product;
- Personal injury or any damage caused by inappropriate use or negligent operation of the user;
- Unauthorized disassemble, repair or modification of the product by the user;
- Any problem, consequential inconvenience, or loss or damage, arising out of the system combined with the devices of the third party;
- Any claim or action for damages, brought by any person or organization being a photogenic subject, due to violation of privacy with the result of that surveillance-camera’s picture, including saved data, for some reason, becomes public or is used for the purpose other than surveillance.

INSTALLATION OF TWO BUILT-IN HDDs:

There is a hard disk holder inside the device for 2 IDE HDDs.
Use a screwdriver to fix the screws. Install the hard disk tray with care to avoid damaging the hard disks, the cables, and/or the case. (Note)

Make sure to set both HDDs as ***master*** or ***cable select***. The settings should be described on the HDDs or in the manuals come with the HDDs.

Note 1: Please power off the system before removing the HDDs.
Note 2: Please refer the work to qualified service personnel or system installers.

PRECAUTIONS

- Please refer all work related to the installation of this product to qualified service personnel or system installers.
- Do not operate the appliance beyond its specified temperature, humidity or power source ratings.
  Use the appliance at temperature within **0°C ~ +45°C** (**32°F ~ 113°F**) and humidity below **85%**.
  The input power source for this appliance is within **90 ~ 264 VAC**, **47 ~ 63 Hz**.
  Performance and lifetime of hard disk drives are easily affected by heat (used at high temperature). It is recommended to use this appliance at temperature within **+20°C ~ +30°C** (**68°F ~ 86°F**)
- Handle the hard disk drives with care.
  It is possible to damage them if they are moved while their motors are still running. Do not move them just after turning the power on or off (for around 30 seconds).
  Protect the hard disk drives from static electricity.
  Do not stack them or keep them upright.
  Do not use an electric screwdriver to fix them.
- Clean only with dry cloth.
- Do not block any ventilation openings.
- Do not use the appliance near any heat sources such as radiators, heat registers, stoves or other apparatus that produce heat.
- Protect the power cord from being stepped on or pinched particularly at plugs, convenient receptacles and the points where they exit from the apparatus.
- Do not drop metallic parts through slots. This could permanently damage the appliance. Turn the power off immediately and contact qualified service personnel for service.
- Handle the appliance with care. Do not strike or shake, as this may damage the appliance.
- Do not expose the appliance to water or moisture, nor try to operate it in wet areas. Do take immediate action if the appliance becomes wet. Turn the power off and refer servicing to qualified service personnel. Moisture may damage the appliance and also cause electric shock.
- Do not use strong or abrasive detergents when cleaning the appliance body. When the dirt is hard to remove, use a mild detergent and wipe gently.
- Do not overload outlets and extension cords as this may result in a risk of fire or electric shock.
- Please make a note of your settings and save them. This will help when you are required to change the system configuration, or when unexpected failure or trouble occurs.
- Distributing, copying, disassembling, reverse compiling, reverse engineering, and also exporting in violation of export laws of the software provided with this product, is expressly prohibited.

Table of Contents

1. Product Overview..... 7
1.1 Features..... 7

2. Panels And Remote Controller..... 8
2.1 Front Panel..... 8-10
2.2 Back Panel..... 11-12
2.3 Remote Controller..... 13

3. Installations..... 14
3.1 Basic Connections..... 14
3.2 Optional Connections..... 15-19

4. Main Screen And Basic Operations..... 20
4.1 Text Input..... 21
4.2 Login And Logout..... 22
4.3 Basic Operations..... 22-23
4.4 Digital Zoom..... 24

5. Menu Display..... 25
5.1 Status Display..... 26
5.2 Volume Control..... 27
5.3 Video Adjustment..... 28
5.4 USB..... 29-30
5.5 Software Upgrade (Administrator)..... 31
5.6 System Shutdown (Administrator)..... 32

6. Setup (Administrator)..... 33
6.1 Pre-Camera Setup..... 34-35
6.2 Camera Setup..... 36-37
6.2.1 Video Loss Setup..... 38
6.2.2 Motion Setup..... 39-41
6.3 Alarm Setup..... 42-43
6.4 SEQ Display Setup..... 44-45
6.5 Scheduled Record Setup..... 46-47
6.6 HDD Setup..... 48-49
6.6.1 HDD Format/Clear..... 50-51
6.7 Password Setup..... 52
6.8 System Setup..... 53-54
6.9 RS-232/422/485 Setup..... 55-56
6.10 Network Setup..... 57-58
6.10.1 E-mail Setup..... 59
6.10.2 FTP Setup..... 60-61

7. PTZ Control…… 62-63

8. Search/Playback/Archive (Administrator/Supervisor) ……..... 64
8.1 Search By Time…… 64-65
8.2 Search By Event / Log Display…… 66
8.3 Search Archived Files…… 67
8.4 Playback/Archive For Search By Time…… 68-69
8.5 Playback/Archive For Search By Event…… 70
8.6 Playback For Archived Files…… 70

9. Remote Access ……..… 71-75

Appendix A – Specifications 76-77
Appendix B – Structures Of Menu Displays 78
Appendix C – Time Zone Table 79-80
Appendix D – Keyboard Control Protocol 81
Appendix E – Recording Table 82-83

1. Product Overview

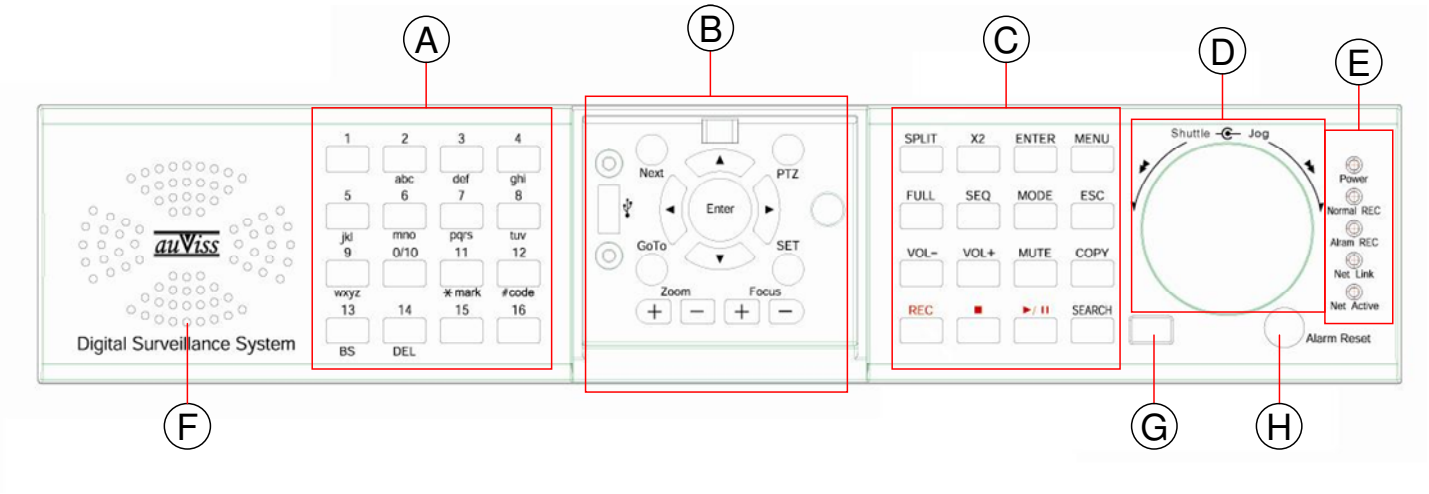
The digital video/audio recorders, AD416/216/209/116/109/104, are designed for use within a surveillance system and are a combination of a hard disk recorder, a video multiplexer, and a web server. To achieve the highest inter-connectivity and inter-operability, this series of digital video/audio recorders are all based on industry-leading front-end to back-end surveillance infrastructure. With state-of-the-art system architecture, powerful hardware compression/decompression engine, and intelligent recording algorithms, multiple operations can be easily achieved without sacrificing the increasing demands of functionality, performance, reliability, and availability in the surveillance industry.

1.1 Features

- Up to 16 color and/or B/W cameras can be connected to AD416/216/116 (up to 9 cameras to AD209/109, up to 4 cameras to AD104)
- Hardware MPEG-4 video compression/decompression with configurable quality
- Hardware ADPCM audio compression/decompression
- Real multiple operation - simultaneous record, live, playback, backup, control, & remote access
- Record capabilities (Images Per Second)–
  Full-D1: AD416: up to 120 (NTSC) / 100 (PAL) IPS
  AD216/209: up to 60 (NTSC) / 50 (PAL) IPS
  AD116/109/104: up to 30 (NTSC) / 25 (PAL) IPS
  Half-D1: AD416: up to 240 (NTSC) / 200 (PAL) IPS
  AD216/209: up to 120 (NTSC) / 100 (PAL) IPS
  AD116/109/104: up to 60 (NTSC) / 50 (PAL) IPS
  CIF: AD416: up to 480 (NTSC) / 400 (PAL) IPS
  AD216/209: up to 240 (NTSC) / 200 (PAL) IPS
  AD116/109/104: up to 120 (NTSC) / 100 (PAL) IPS
- Playback capabilities –
  Full-D1: up to 30 (NTSC) / 25 (PAL) IPS
  Half-D1: up to 60 (NTSC) / 50 (PAL) IPS
  CIF: up to 120 (NTSC) / 100 (PAL) IPS
- Real-time live display, 30 (NTSC) / 25 (PAL) IPS, for each channel
- Event recording, time-lapse recording or both
- Playback search by time or event (alarm, motion, & video loss)
- Versatile display formats: full-screen, 4, 7, 9, 10, 13, and 16 split windows
- Intelligent motion detection with programmable area and sensitivity
- Powerful alarm processor with configurable triggering conditions and reactions
- Up to two built-in hard disk drives
- IEEE 1394 extension for external hard disk drives
- Video/audio backup to USB2.0 storage devices
- Ethernet interface for remote access through web browser or proprietary remote software, remote alarm notification, and FTP video/audio storage
- PTZ control capabilities & RS-422/RS-485 keyboard control capabilities
- Digital watermark
- Multi-lingual support
- Multi-level password and authentication key protection to ensure high degree of security

2. Panels and Remote Controller

2.1 Front Panel



A: Alpha-numeric Buttons (1-9, 0, *, #)

These buttons are used to enter text and number in the way similar to most of the mobile phones.

These buttons can also be camera selection in most of the circumstances. During full screen display, press the number to switch to selected camera. During split window display, press the number to change the focus camera to desire channel.

B: PTZ Camera control panel

1. **PTZ Button**

In main screen display, press this button to enter/exit PTZ control if the focus camera is a PTZ camera.

2. **NEXT Button**

Press this button for the next miscellaneous control.

3. **GOTO Button**

Press this button to move the camera to the preset position.

4. **SET Button**

Press this button to set the preset position of the PTZ camera.

5. **Left/Right Buttons (◄,►)**

Press these buttons to pan the camera.

6. **Up/Down Button (▲/▼)**

Press this button to tilt up/down the camera.

7. **ENTER Button**

This button is used to start/stop the selected PTZ control mode

8. **Zoom** +/-

Press +/- to control the lens zoom in/out

9. **Focus** +/-

Press +/- to control the focus near/far.

10. **Reset Button**

Use a thin stick to touch this button to reset the whole system should it hang up abnormally.

11. **USB connector (USB)**
Connect to USB 2.0 compatible storage device, such as USB 2.0 disk drive, DVD+RW, card reader, etc.

12. **DVR ID Switch**
Used to set the DVR ID (1-4) of this unit for one I/R remote controller to control up to 4 sets of digital video/audio recorders.

C: DVR Control Buttons

1. **Split Button**
Press this button to switch from full screen display to split-window display or for next split-window display (4-7-9-10-13-16-4-7….).

2. **X2 Button**
In full screen display (Live/Playback), press this button for Digital Zoom (X2/X4).

3. **ENTER Button**
This button is used as “enter” key in most circumstances to confirm the setting.

4. **MENU Button**
Press this button to display the main menu.

5. **Call Button**
Press this button to switch to call screen display of the focus camera in main screen display. In some dialogs, this button is used as a miscellaneous function key.

6. **SEQ Button**
Press this button to switch to or return from SEQ display mode in main screen display. In some dialogs, this button is used as a miscellaneous function key.

7. **MODE Button**
Press this button to toggle between live mode and playback mode in main screen display. In some dialogs, this button is used as a miscellaneous function key.

8. **ESC Button**
Press this button to escape to the upper level display.

9. **Vol - Button**
Press these buttons to turn down the volume in most circumstances. In some dialogs, this button is used as a miscellaneous function key.

10. **Vol + Button**
Press these buttons to turn up the volume in most circumstances. In some dialogs, this button is used as a miscellaneous function key.

11. **MUTE Button**
Press this button to mute the audio.

12. **Copy Button**
Press this button to copy the playback images to the storage device connected to the USB port. Press this button again to stop copying.

13. **REC Button**
Press this button to force manual recording. To stop manual recording, press it again and go back to schedule recording as setting in the menu.

14. **Stop Button (■)**
Press this button to stop the playback.

15. **Play/Pause Button (▶/Ⅱ)**
Press this button to play the recorded images, or to pause the playback.

16. **SEARCH Button**
Press this button to display the search menu in main screen display. In some dialogs, this button is used as a miscellaneous function key.

D: Jog Dial and Shuttle Ring

1. **Shuttle Ring**
In Live Mode: Turn the shuttle clockwise to move the cursor or focus window to the right. Turn the shuttle counterclockwise to move the cursor or focus window to the left. Or press ◄►
In Playback Mode: Turn the shuttle clockwise for fast forward playback. Turn the shuttle counterclockwise for fast backward playback.

2. **Jog Dial or ▲▼**
Turn the jog dial clockwise to move up the cursor or focus window. Turn the jog dial counterclockwise to move down the cursor or focus window. Or press▲▼
In Playback Mode: Turn the jog clockwise for step playback (picture by picture).

E: LED indicators

Indicators for POWER (Power On: Red), Normal Recording (Active: Green), Alarm Recording (Active: Red), Net Link (Active: Yellow), and Net Active (Active: Green).

F: Ventilation Holes

There are two built-in HDDs inside the device. These ventilation holes are designed for the heat dissipating. Please keep these holes out of obstacles.

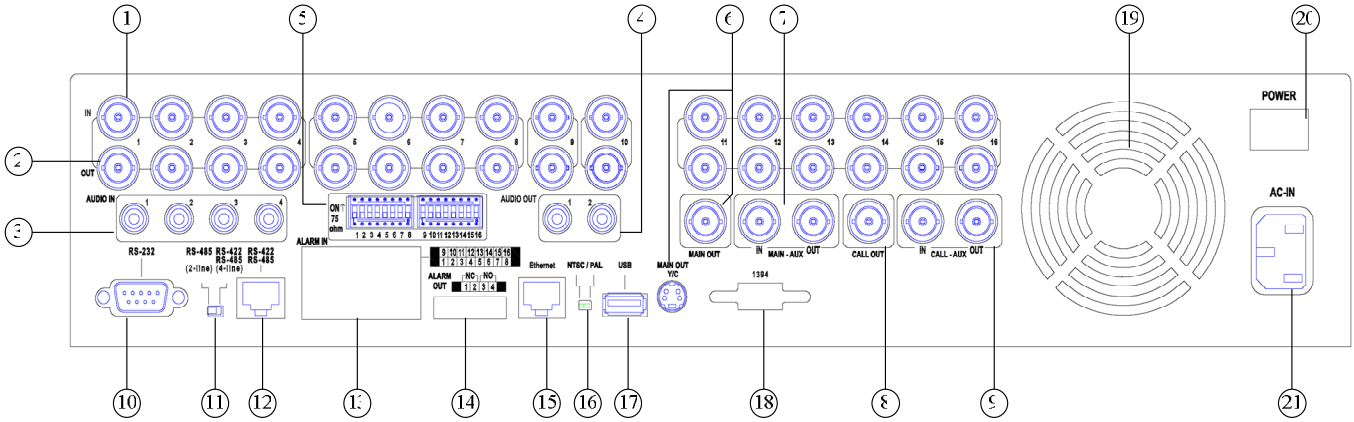
G: IR Receiver

This is the receiver for the IR remote controller. Please keep it out of obstacles when using the IR remote controller.

H: Alarm Reset Button

Press this button to cancel alarm activation, and return the system to the condition before the alarm was activated.

2.2 Back Panel



1. **Video Input Connectors (1-16 for AD416/216/116, 1-9 for AD209/109, 1-4 for AD104)**
   Connect system cameras to these BNC connectors. The corresponding 75Ω termination must be made unless the video output terminal is connected.

2. **Video Output Connectors (1-16 for AD416/216/116, 1-9 for AD209/109, 1-4 for AD104)**
   Connect these BNC connectors for looping the corresponding camera video inputs.

3. **Audio Input Connectors (AUDIO IN 1-4)**
   These RCA connectors accept line-in audio signals supplied from external devices such as microphone amplifiers.

4. **Audio Output Connectors (AUDIO OUT 1-2)**
   These connectors supply line-out audio signals to external devices such as speakers. Recorded audio will be supplied from AUDIO OUT during playback.

5. **75Ω termination**
   Set each of the DIP switches to ON unless the corresponding video output terminal is connected.

6. **Main Monitor Output Connectors (MAIN OUT, MAIN OUT Y/C)**
   Connect TV monitors to the mini-din S-video connector or the BNC connector for main monitor display.

7. **MAIN-AUX Connectors (MAIN-AUX IN/OUT)**
   Used to daisy-chain to TV monitor. MAIN-AUX OUT has the same output as MAIN OUT, but can be switched off through RS-485 keyboard control.

8. **Call Monitor Output Connector (CALL OUT)**
   Connect TV monitor to this BNC connector for call monitor display.

9. **CALL-AUX Connectors (CALL-AUX IN/OUT)**
   Used to daisy-chain to TV monitor. CALL-AUX OUT has the same output as CALL OUT, but can be switched off through RS-485 keyboard control.

10. **RS-232 Connector**
    Connect this connector to PTZ camera(s).

11. **RS-422/485 Selector Switch**
    This switch is used to select RS-485 (2-line) or RS-422/485 (4-line).

12. **RS-422/485 Connector**
    Connect this connector to RS-422/485 compatible PTZ camera(s) or keyboard. The above-mentioned RS-422/485 Selector Switch must be set correctly. Please refer to the manuals come with the RS-422/485 compatible devices for the correct settings. Please refer to Appendix D for the Keyboard Control Protocol for the digital video recorder.

13. **Alarm Input Connectors (ALARM IN 1-16)**
    Connect these connectors to external devices such as sensors or door switches.

14. **Alarm Output Connectors (ALARM OUT 1-4)**
    Connect these connectors to 2 Normally Closed (NC) alarm outputs (1-2) and 2 Normally Open (NO) alarm outputs (3-4).

15. **Ethernet Connector**
    Connect this unit to a 10/100Base-T Ethernet network through this port.

16. **NTSC/PAL Selector Switch**
    Set this unit to NTSC or PAL according to the local TV system.

17. **USB Connector (USB)**
    Connect this port to USB 2.0 compatible storage device, such as USB 2.0 disk drive, DVD+RW, card reader, etc.

18. **IEEE 1394 Connector (optional)**
    Connect this port to external ABox400 Hard Disk Boxes for additional 4 HDDs each ABox400.

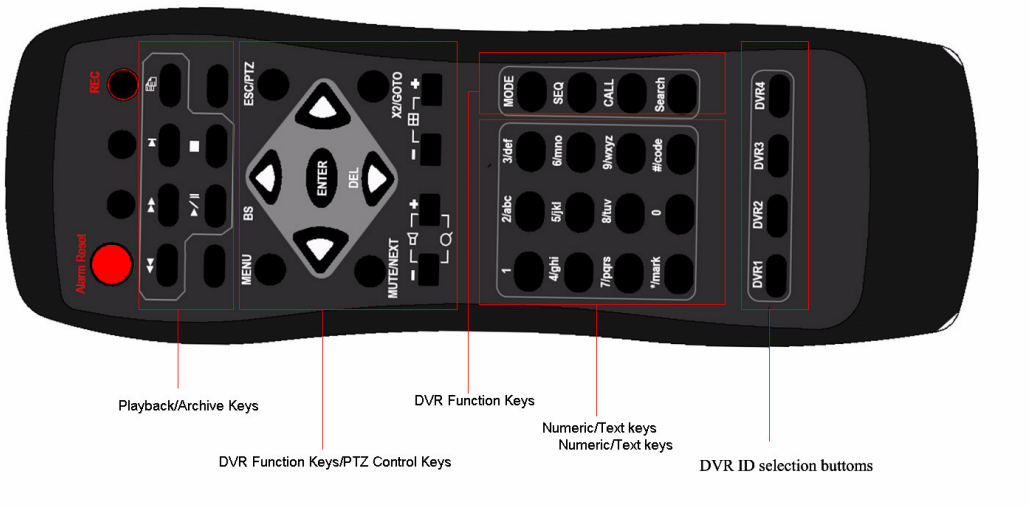
19. **Cooling Fan**
    The cooling fan for the internal SPS(Switching Power Supply).

20. **Power Switch (POWER)**
    Turn the power of this unit on/off.

21. **Power Cord Inlet (AC IN)**
    Connect a power cord to this inlet. It accepts 90~264 VAC, 47~63 Hz power source.

2.3 Remote Controller

The remote controller ARC-400 is an optional accessory to ease the user's operations. You can do all the operations by the remote controller instead of the buttons on the front panel. The effective distance is about 10 meters without any obstacle.



1. **DVR ID Selection Buttons (DVR #1-4)**
   Press these buttons to select the DVR to be controlled by the remote controller. The remote controller can control up to 4 sets of DVRs. Please make sure that the DVR ID Switch for each of the DVRs is set correctly.

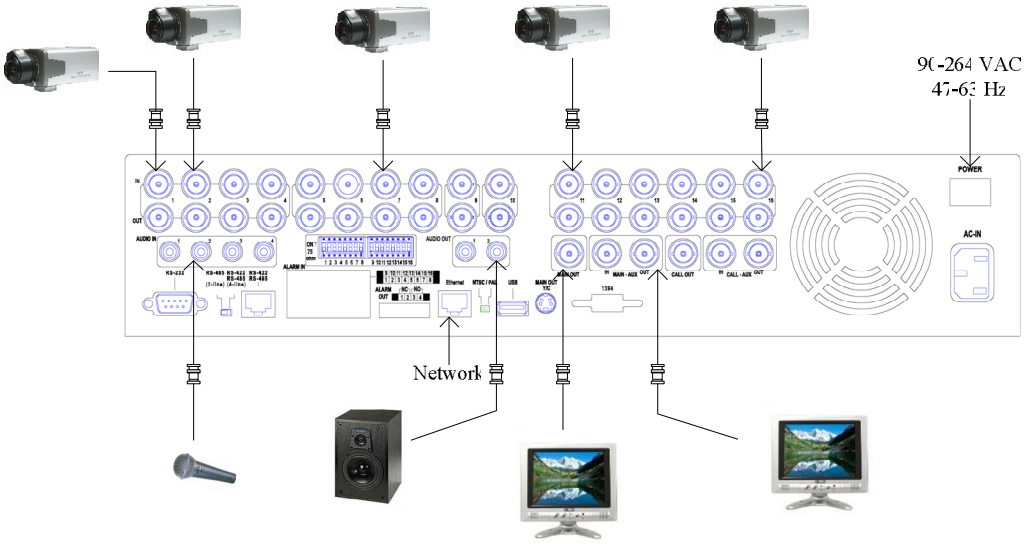
2. **The Other Buttons**
   Each of these buttons corresponds to one of those buttons on the front panel. Please refer to the descriptions in Section 2.1. Due to the dimension of the remote controller, the front panel buttons are not able to link directly to the remote controller. There are a few keys are used as multi-functional. The definitions are same as descriptions in Section 2.1 while the Call key is refer to the Call button on the front panel in most of circumstances.

3. Installations

The installations described below should be made by qualified service personnel or system installers.

3.1 Basic Connections

Please refer to the following diagram for the connections.



Please make sure to set the NTSC/PAL Selector Switch on the back panel according to the local TV system for the digital video/audio recorder to work correctly.

- **Cameras**
  Connect the camera video input connectors to the video outputs from system cameras or other composite video sources via coaxial cables.

- **Main monitor**
  Connect the main monitor output connector (BNC or S-video) to a surveillance TV monitor. The TV monitor displays selected live or recorded cameras in any available split window format.

- **Hard disk drive(s)**
  Make sure to install at least one hard disk drive inside the hard disk tray if you order the model without HDDs. If there are two HDDs, please set both HDDs as ***master*** or ***cable select***. The settings should be described on the HDDs or in the manuals come with the HDDs.

  Note 1: Whether the upper HDD or the lower one is set as HDD#1 is fine for the system but to connect the upper one to HDD#1 cable is recommended.
  Note 2: **Each of the HDDs must be formatted before it can be used to**

record video/audio. Please refer to Section 6.6.1 HDD Format/Clear to format the HDDs.

- **Power**
  Plug 115 VAC or 230 VAC power source into the power socket.

3.2 Optional Connections

- **Audio inputs**
  Connect the audio input connectors to the audio line-outs from system cameras or other audio sources. Please make sure to associate the audio inputs with the cameras in Camera Setup as described in Section 6.2 accordingly.

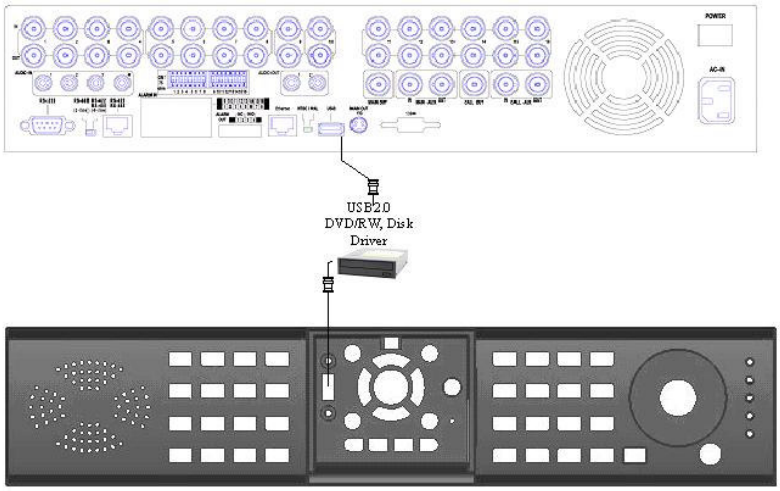
- **Audio outputs**
  Connect the audio output connectors to the audio line-ins from speakers.

- **Alarm inputs**
  Connect the alarm inputs to NC and/or NO type of alarm signals. Please make sure to setup the alarm configurations in Alarm Setup as described in Section 6.3 accordingly.

- **Alarm outputs**
  Connect the alarm outputs 1-2 to NC type of alarm signals, alarm outputs 3-4 to NO type of alarm signals.

- **Ethernet**
  Connect the Ethernet connector to a standard twisted-pair Ethernet cable for remote access via LAN or internet. Please make sure to setup the related configurations as described in Section 6.10 Network Setup.

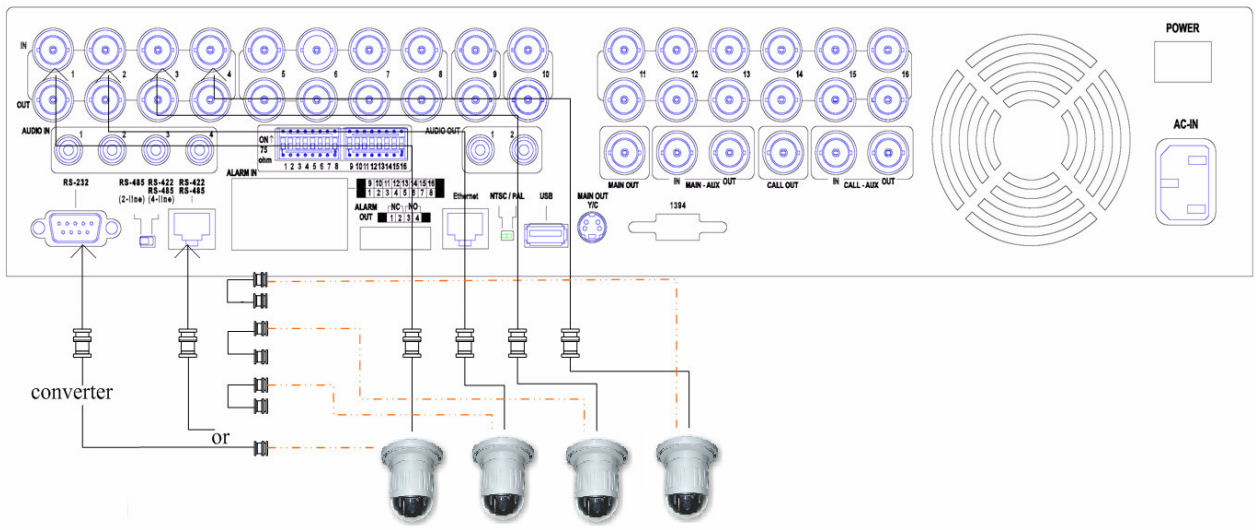
- **USB 2.0 disk drives, DVD+RW, card reader, etc.**
  If the user wants to use USB2.0 peripheral device to retrieve important recorded images and/or audio, please connect it to the USB port connectors (one on the front panel, the other on the back panel).



- **I/R remote controller**
  If there are more than one digital video/audio recorders to be controlled by the I/R remote controller, please set the DVR ID on the front panel. One I/R remote controller can control up to 4 sets of DVRs (with ID 1-4 individually).

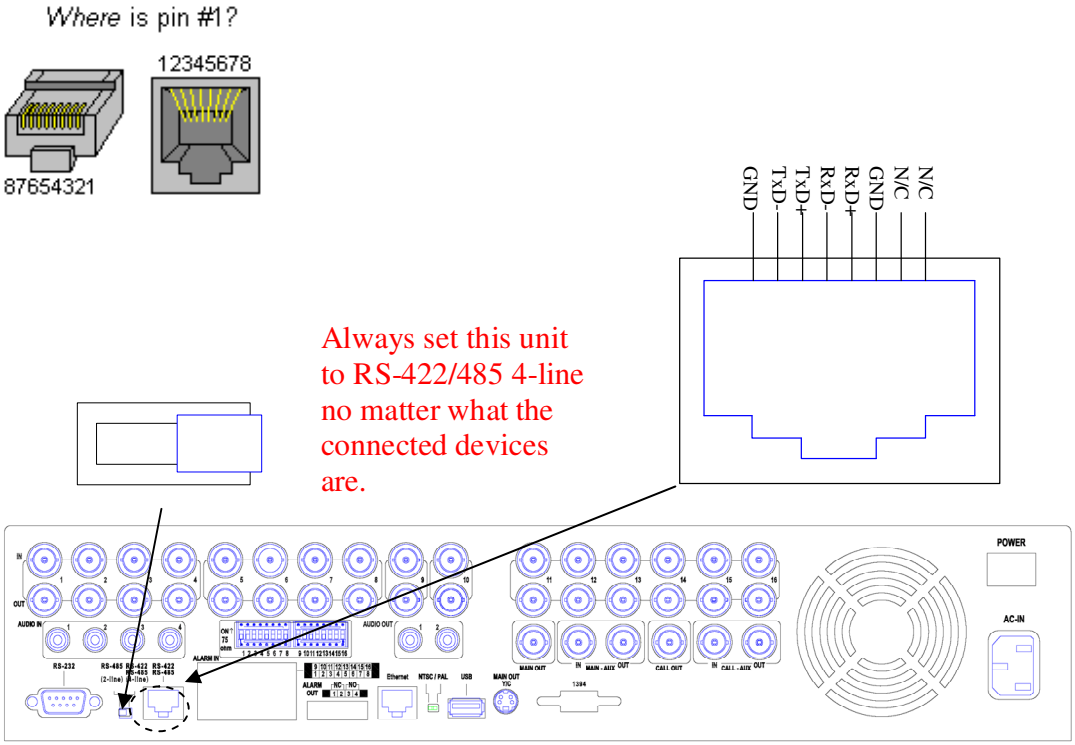
- **Call monitor**
  Connect the call monitor output connector to a surveillance TV monitor. This monitor displays the full screen images of the cameras associated with the events (alarm or motion) or the images from the installed cameras sequentially according to the SEQ Display Setup (Section 6.4) for call monitor.

- **PTZ Cameras**
  Connect the RS-232 connector or the RS-422/485 connector to PTZ camera(s) via the appropriate cable. The system supports a variety of different PTZ cameras, including Auviss ASD Series Speed Dome, Pelco D protocol Dome, SamSung SCC-641P, Kalatel Cyber Dome, etc. But different PTZ cameras can coexist in a system only if they support the same protocol. Please make sure to set the PTZ ID of the camera(s), and setup the camera (Section 6.1), and RS-232 or RS-422/485 (Section 6.9) accordingly. Please also make sure to set the RS-422/RS-485 Selector Switch if you are using the RS-422/485 port.

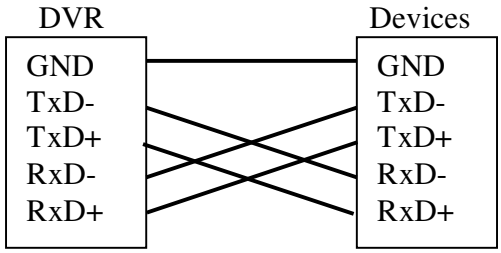


■ RS-485 keyboard

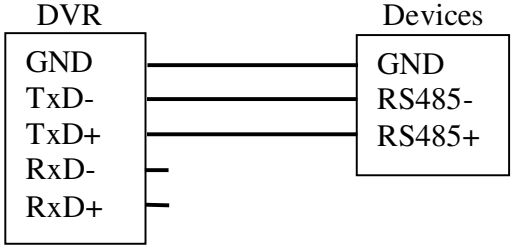
Connect the RS-422/485 connector to a RS-485 keyboard controller (AKB-200/300) via the appropriate cables. Please refer to the following diagram for the pin definitions of the RS-422/485 connector. Please make sure to set the RS-422/RS485 Selector Switch and setup the RS-422/485 configurations as described in Section 6.9 accordingly. Please refer to Appendix D for the Keyboard Control Protocol for the digital video recorder.



For 4-line devices (such as keyboard) Pin #1~Pin35



For PTZ cameras Pin#1~Pin#3 (Normally connect only Pin#2 & Pin#3 also work)

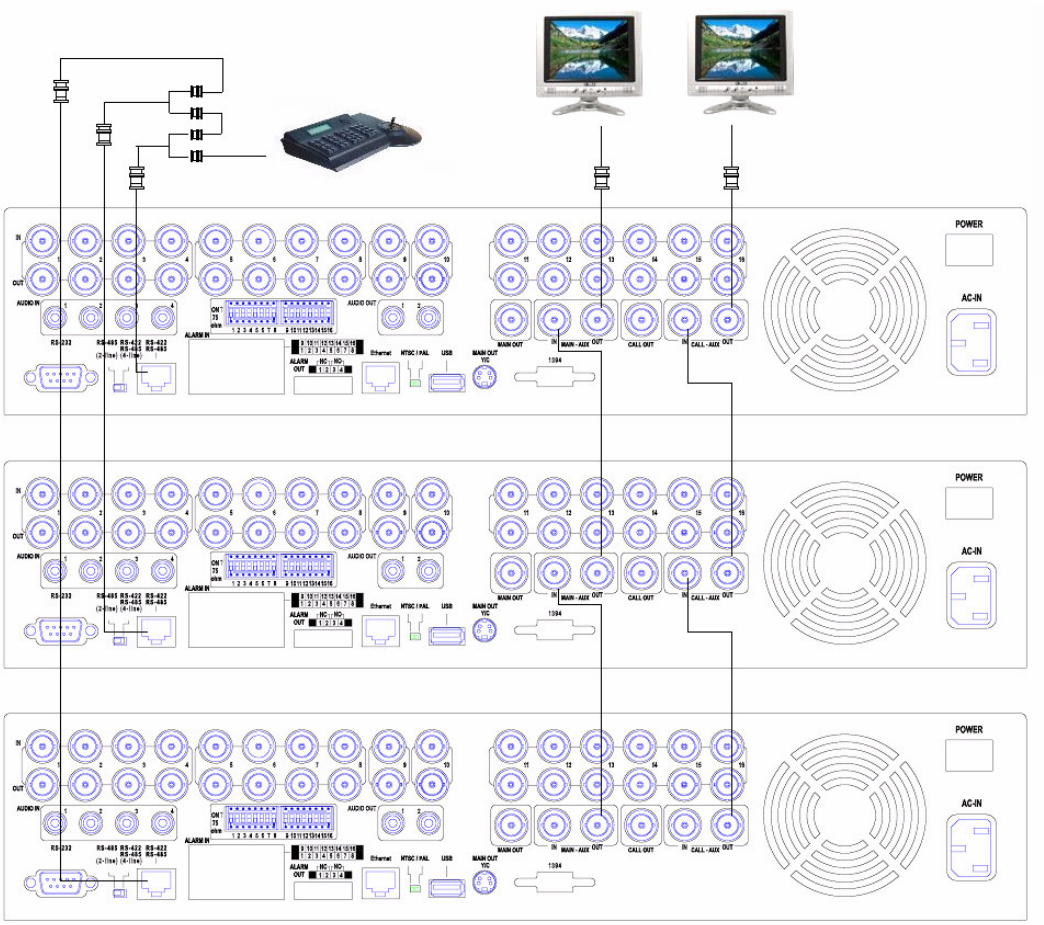


- **MAIN-AUX monitor**

  Please refer to the diagram below to connect the MAIN-AUX monitor output connector to a surveillance TV monitor or the MAIN-AUX monitor input connector of another digital video/audio recorder. The MAIN-AUX monitor, if enabled, has the same output display as the main monitor, and is typically used with RS-485 keyboard controller for distant monitoring and control (e.g. in central control room).

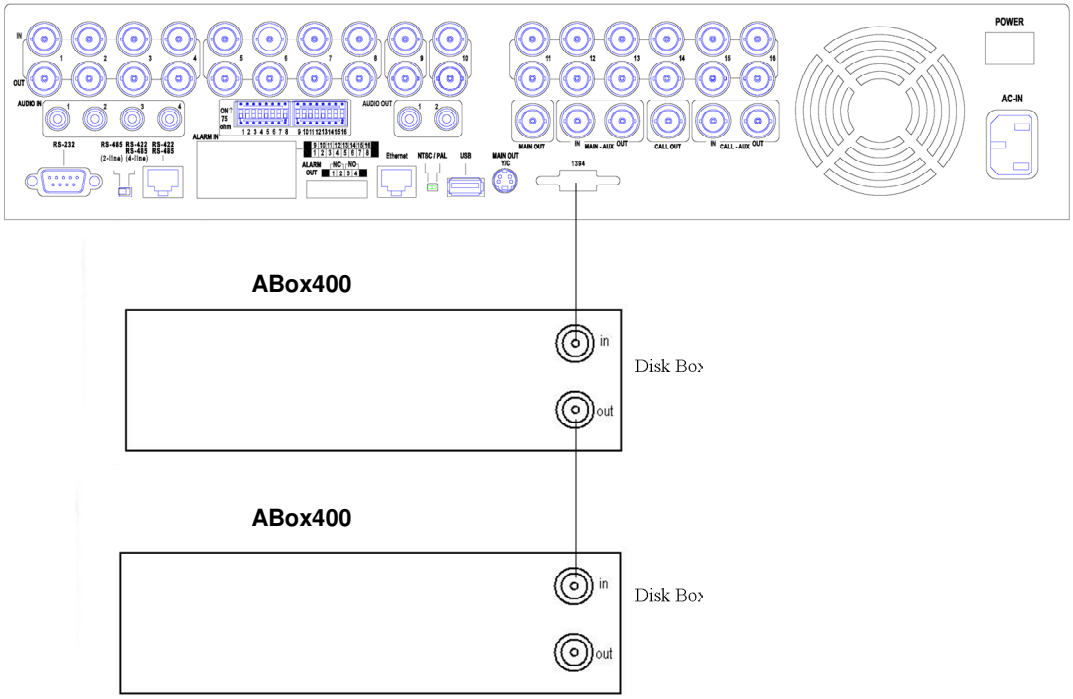
- **CALL-AUX monitor**

  Please refer to the diagram below to connect the CALL-AUX monitor output connector to a surveillance TV monitor or the CALL-AUX monitor input connector of another digital video/audio recorder. The CALL-AUX monitor, if enabled, has the same output display as the call monitor, and is typically used with RS-485 keyboard controller for distant monitoring and control (e.g. in central control room).

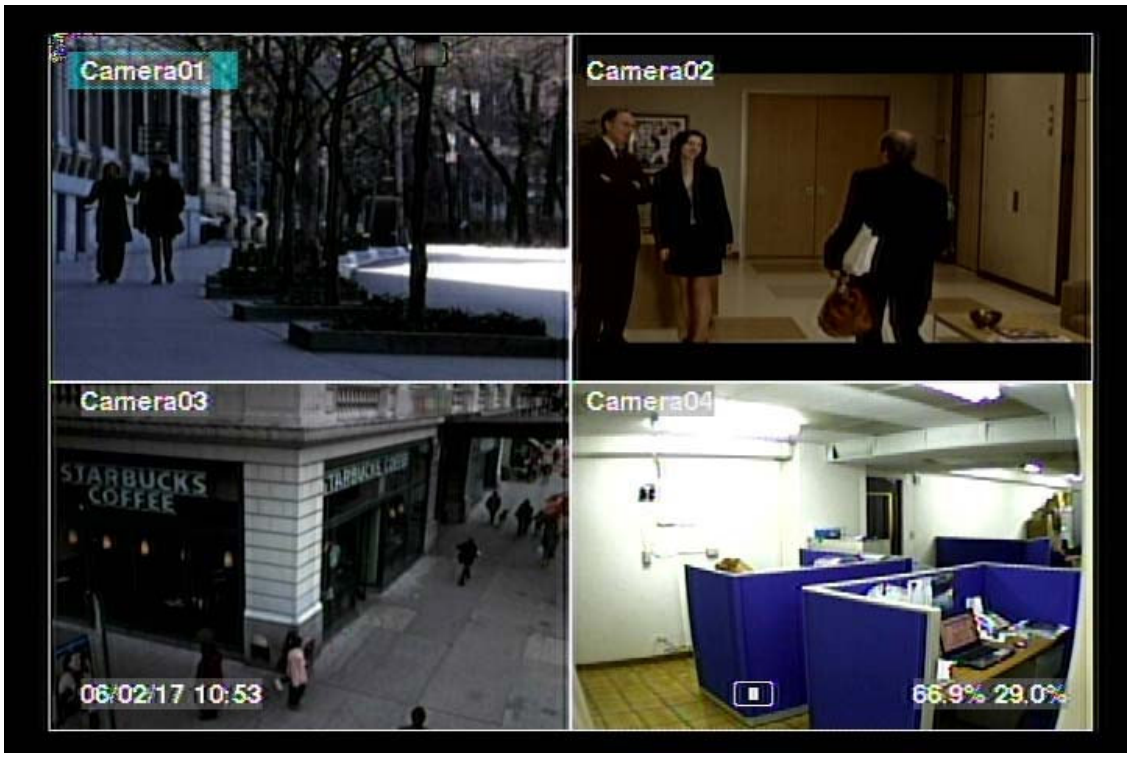


■ ABox400 Hard Disk Boxes

Connect the IEEE 1394 connector to a ABox400 hard disk box via IEEE 1394 cable if IEEE 1394 Extension Card has been installed inside the digital video/audio recorder. Up to 8 sets of ABox400 hard disk boxes can be daisy-chained together.



4. Main Screen and Basic Operations



The split-window screen, as shown above, is the main screen after system startup. There are several types of split-window screens, including 1-Window, 4-Window, 7-Window, 9-Window, 10-Window, 13-Window, and 16-Window. The system will remember the last one before normal shutdown (as described in Section 5.5) of the system. In addition to the split windows, the system time is displayed on the lower-left corner, the system states on the lower-right corner, and the rolling screen messages, if shown while certain event occurs, on the lower center.

The system states, from right to left, are described as the followings:

(1) Alarm recording percentage,
(2) Normal recording percentage,
(3) Playback Speed – X1, X2, or X4,
(4) Manual record ON/OFF – REC shown for ON.
(5) SEQ display ON/OFF or playback state – SEQ icon shown for SEQ display ON, the other icons for different playback states.

4.1 Text Input

There are certain circumstances that the system requires the user to enter text, such as system login, camera title setup, and so on. Please follow the steps below to enter text:

(1) Press **ENTER** to edit the highlighted option. The flashing cursor will be shown to indicate the editing point.

(2) Turn the **Shuttle Ring** or press ◄► to move the cursor to the left/right.

(3) Press **code** in text editing mode to change text case. (If this entry can accept number only, pressing **code** will have no effects.) Indicators on the screen show the current setting:
123 = Number only
abc = No capital letters
ABC = All capital letters
CODE = Internal code for the selected language, such as Chinese, Japanese, etc.

(4) Press a number key (**1-9, 0)** repeatedly until the character you want appears. (**1** for 1 or space, **2** for 2, a/A, b/B, or c/C, the others as shown on the keypad) If internal **CODE** is selected, a **CODE box** will be shown (after the first code is entered) for each new code to be entered. Please check the internal code table for the selected language. For 2-byte code, e.g. Chinese or Japanese, the code accepted is from 0000 - FFFF.

(5) Press **mark** to bring up a list of punctuation marks and special characters. The highlighted character in the list shows the selected one. Turn the Shuttle/Jog to change the selection. Or press◄►▲▼

(6) If you make a mistake, press **BS** to remove the character to the left of the cursor, or press **DEL** to delete the character at the current cursor position.

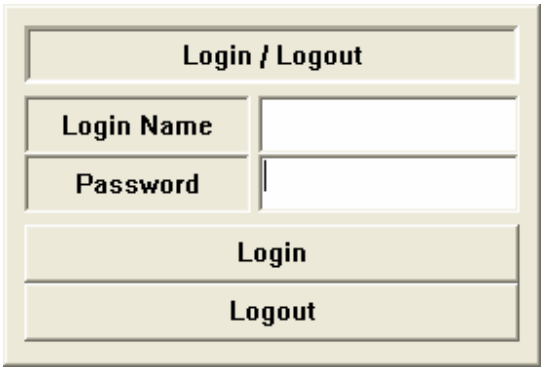
(7) In text editing mode, internal code box, and mark list, press **ENTER** to exit and save changes, press **ESC** to exit without making changes.

4.2 Login and Logout

There are three password levels in the system, including **Administrator** (highest), **Supervisor**, and **Operator** (lowest). If the user does not login the system, he/she will be treated as “Guest” and can only view live video display.

The system allows up to 18 user accounts. The administrator can set up the login name and password for each user. (Please refer to Section 6.7 for Password Setup.)
The Operator can operate live video display, the Supervisor can operate live video display, image playback and archive, and the Administrator can operate everything.

To login/logout the system, press **MENU** in split-window display to call up Menu display, and then press **ENTER** when the highlighted option is **Login**/**Logout** to enter Login/Logout display as shown.



In Login/Logout display, follow the Text Input method described in section 4.1 to enter the **Login name** and **Password**, turn **Jog Dial** or▲▼ to highlight and select **Login** option, and then press **ENTER** to login the system. If the user wants to logout the system, just turn **Jog Dial** or ▲▼to highlight and select **Logout** option, and then press **ENTER**. Press **ESC** to exit without making changes.

There is one factory-preset login name/password aa/11 at **Administrator** level. The user can use it to login the system for the first time.

Should the user have forgotten all the administrator-level passwords, please contact the local dealer or installer to recover from it.

4.3 Basic Operations

The basic user’s operations after he/she has logged into the system are described below:

- **Numeric (ENTER)**
  Press these buttons to change the camera for the focus window.

- **Alarm Reset**
  Press this button to cancel alarm activation, i.e. reset the alarm outputs and silence the buzzer.

- **MODE (Administrator/Supervisor)**
  In split-window display, press this button to change circularly the live/playback mode for the focus window and the other windows that form a rectangle on the screen.

- **SEQ**
  Press this button to switch to or return from SEQ display mode. In SEQ display mode, each page in the sequence will be shown for the preset page dwelling time sequentially, and SEQ icon will be shown on the lower-right corner of the screen.

- **CALL**
  In split-window display, press this button to switch to or return from full screen display of the focus camera.

- **SEARCH (Administrator/Supervisor)**
  In split-window display, press this button to display the available search menus circularly. The system will remember the last one the user chose.

- **REC**
  Press this button to force manual recording. To stop manual recording, press it again. REC will be shown on the lower-right corner of the screen if manual recording is ON.

- **MENU**
  In split-window display, press this button to display the versatile menu.

- **PTZ**
  In split-window display, press this button to enter PTZ control mode if the focus camera is a PTZ camera.

- **X2**
  In full screen display, press this button to enter Digital Zoom mode. Please refer to Section 4.4 Digital Zoom for the detailed operations in Digital Zoom mode.

- **Jog/Shuttle**
  Turn the Jog/Shuttle or press ▲▼◄► to move focus. The title of the camera for the focus window is highlighted as shown on the screen.

- **Vol+/- , MUTE**
  Press these buttons to control the volume.

- **Split**
  Press this buttons to circulate among the available split-window displays.

4.4 Digital Zoom

The system supports X2/X4 Digital Zoom function. To use this function, press **X2** button in full screen display to enter Digital Zoom mode. There will be a zoom window shown in the video window as shown. The zoom window (a) will always be shown at zoom factor X1, (b) can be shown or hidden at zoom factor X2, and (c) will never be shown at zoom factor X4. The operations in Digital Zoom mode are as below:

- **Jog/Shuttle** Shuttle Jog
  Turn the Jog/Shuttle or press ▲▼◄► to
  (a) move the zoom window if it's shown in the video window, or
  (b) navigate the video window around if the zoom factor is X2 or X4.

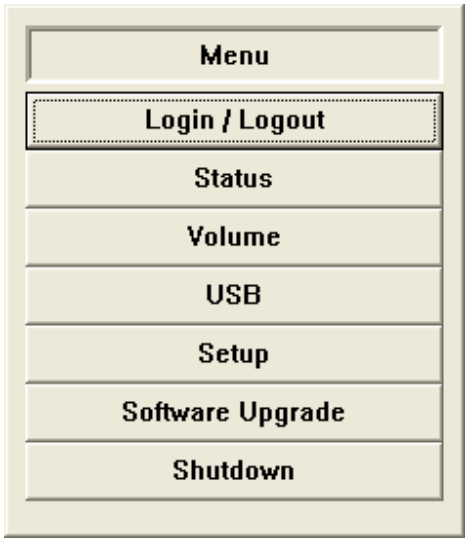
- **ENTER**
  Press this button to zoom in the zoom window, from X1 to X2 or from X2 to X4, if the zoom window is shown in the video window.

- **X2**
  Press this button to
  (a) show/hide the zoom window if the current zoom factor is X1/X2, or
  (b) zoom out the video window back to zoom factor X1 if the current zoom factor is X4.

- **ESC**
  Press this button to escape from Digital Zoom mode, and return to normal full screen display. The video window will always return to zoom factor X1.

5. Menu Display

In split-window display, press **MENU** to call up Menu display as shown.



There are a variety of displays under Menu display. In Menu display and all the subsequent displays, the items enabled are shown in black-colored text, and those disabled in white-colored text. Please refer to Appendix B for the Structure of Menu Displays. Please refer to Section 4.2 for Login/Logout display.

The user's operations are described as the followings:

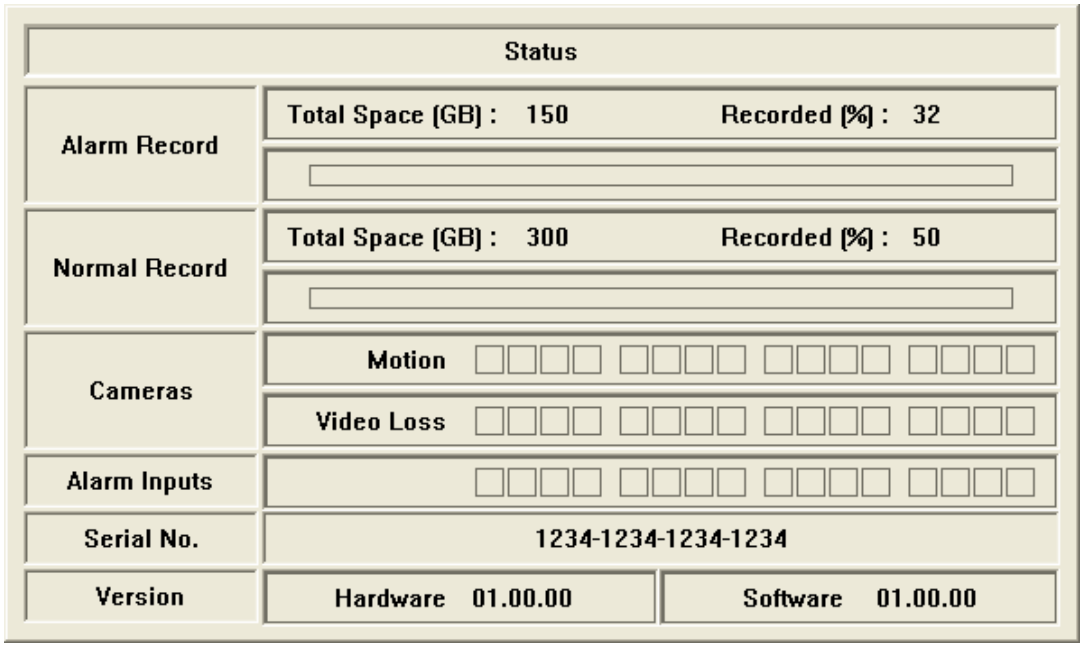
- **Jog Dial**
  Turn the **Jog Dial** or press ▲▼to change the highlighted item.

- **ENTER**
  Press this button to enter the detailed display of the highlighted option. For the details of each option, please refer to the following sections.

- **ESC**
  Press this button to escape from Menu display, and return to split-window display.

5.1 Status Display

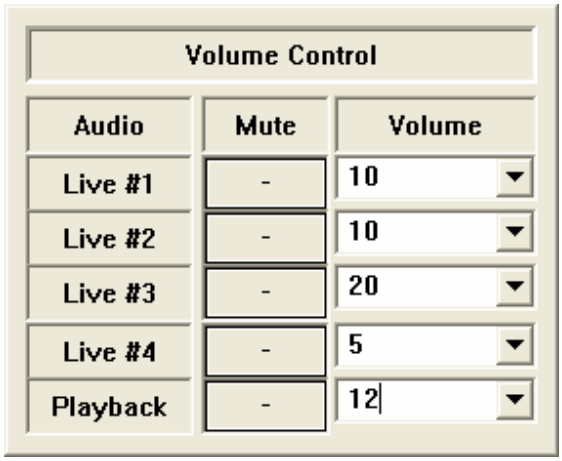
In Menu display, turn the **Jog Dial** or press ▲▼to change the highlighted option to **Status**, and then press **ENTER** to call up Status display as shown.



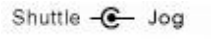
Status display includes Alarm Recording Status, Normal Recording Status, Camera Status, Alarm Input Status, Product Serial Number, and Product Version Number. Press **ESC** to escape from Status display, and return to Menu display.

5.2 Volume Control

In Menu display, turn Jog Dial or press ▲▼to change the highlighted option to **Volume**, and then press **ENTER** to call up Volume Control display as shown.



The general operations are as below:

- **Jog/Shuttle** 

  Turn the Jog/Shuttle or press ▲▼◄►to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Menu display. If the contents have been modified, a Save dialog will be shown to ask the user to save the changes, press **ENTER** to exit and save, **ESC** to exit without saving.

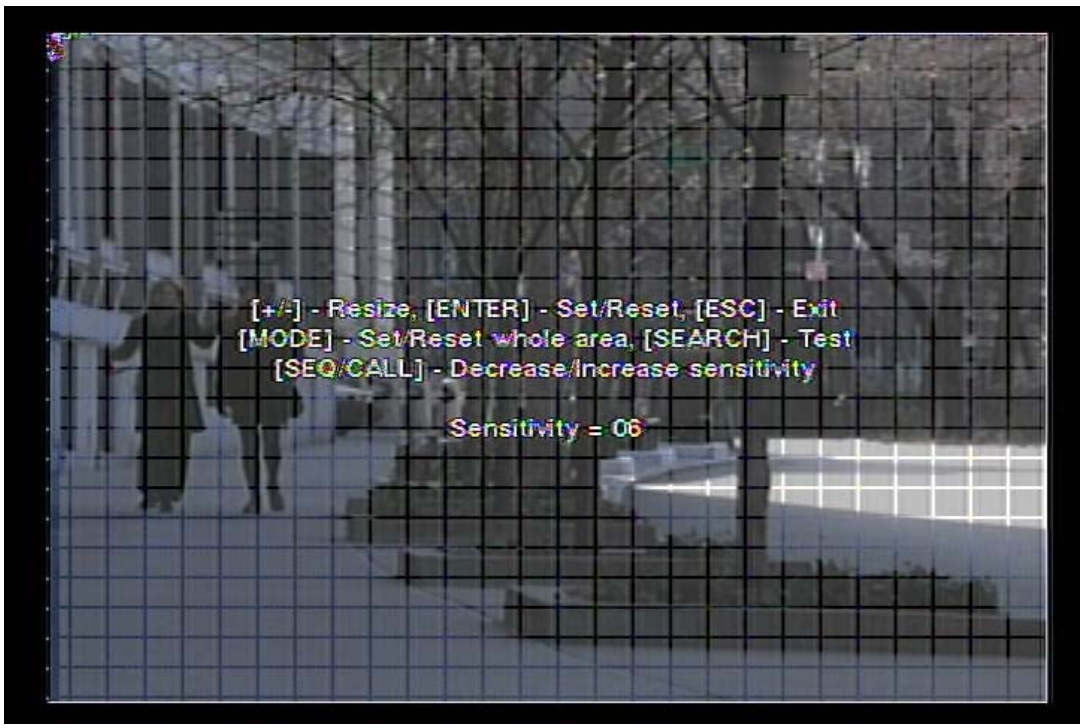
Following is a brief description for each item and its specific operations:

- **Mute** – to mute the selected audio channel. Press **ENTER** to check/uncheck this item. The default setting is "**-**" - unchecked.

- **Volume** – the volume of the selected audio channel. Press **+/-** buttons to change the value (1-20).

5.3 Video Adjustment

In Menu display, turn Jog Dial or press ▲▼to change the highlighted option to **Video Adjustment**, and then press **ENTER** to call up Video Adjustment display as shown.


[+/-] - Resize, [ENTER] - Set/Reset, [ESC] - Exit
[MODE] - Set/Reset whole area, [SEARCH] - Test
[SEQ/CALL] - Decrease/Increase sensitivity
Sensitivity = 06

There are 4 items which can be adjusted, including Brightness, Contrast, Hue, and Saturation. The operations are as below:

- **Jog Dial**
  Turn the Jog Dial or press ▲▼to select the items.

- **Numeric (ENTER)**
  Press these buttons to change the camera.

- **+/-**
  Press these buttons to adjust the selected item.

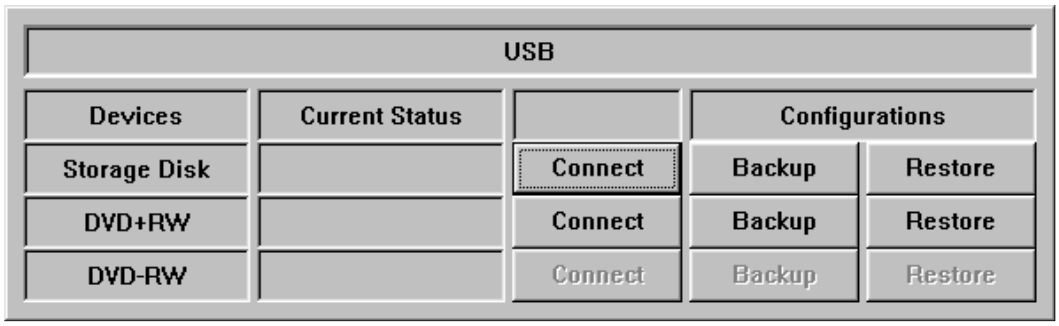
- **MODE**
  Press this button to restore the values.

- **ESC**

Press this button to escape from this screen, and return to Menu display.

5.4 USB

In Menu display, turn the Jog Dial or press ▲▼to change the highlighted option to **USB**, and then press **ENTER** to call up USB Connect/Disconnect display as shown below.



The system supports a variety of USB 2.0 storage devices, including Storage Disk such as USB 2.0 disk drives, DVD+RW, and card reader. (DVD-RW is not supported, and hence the corresponding option is disabled.) The operations are as below:

- **Jog Dial**
  Turn the Jog Dial or press ▲▼to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Menu display.

- **Connect/Disconnect** – If the specific USB device is disconnected (as shown in Current Status), please plug the USB device in one of the USB ports of the system, and then press **ENTER** to command the system software to connect with the USB device. If the specific USB device is already connected (EX. Read/write, as shown in Current Status), please press **ENTER** to command the system software to disconnect with the USB device first, and then unplug the USB device from the USB port.

Note 1: The USB device has to be connected by the system software before it can be used to read/write.

Note 2: Some USB devices may have compatibility problems. Please contact your local dealer or installer for the supported devices.

- **Backup**
  Press **ENTER** when this item is selected to backup the configurations of this unit to the corresponding USB device.

- **Restore**

Press **ENTER** when this item is selected to restore the configuration files in the corresponding USB device to this unit.

Some USB 2.0 Devices Tested

TwinMOS-Mobile Disk Z4
USB2.0 FMZ512M, FMZ1GBM
(FMZ1GBM is the Standard Options for ADxxx-1HDU, ADxxx-2HDU models)

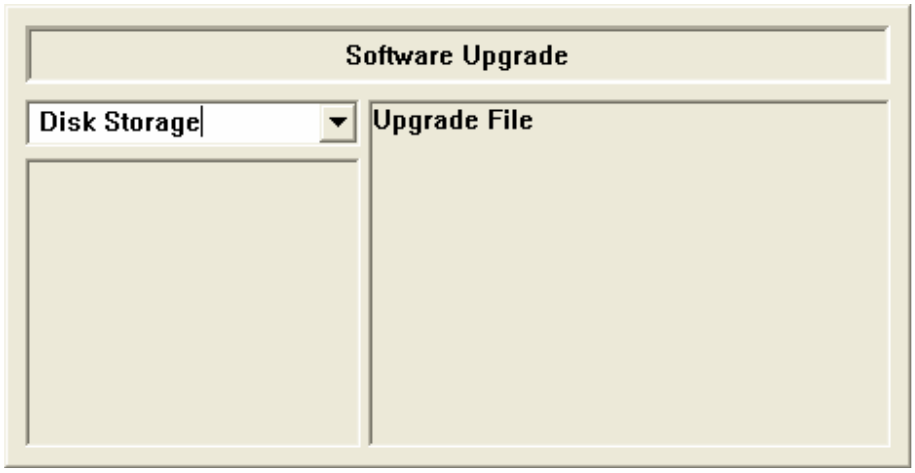
USB-Storage Enclosures 5.25" –
Macpower's Alumni Prefect USB 2.0 - PF-U2MS**.**

USB-Disk Storage –
Transcend's JetFlash 150 Series.

DVD+RW –
Asus DRW-1608P Series,
Pioneer DVR-A11 Series.

5.5 Software Upgrade (Administrator)

In Menu display, turn the Jog Dial or press ▲▼ to change the highlighted option to **Software Upgrade**, and then press **ENTER** to call up Software Upgrade display as shown.



The operations are as below:

- Shuttle Jog
  Turn the Jog/Shuttle or press ▲▼◄►to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Menu display.

Following is a brief description for each item and its specific operations:

- **Disk Storage** – to select the disk storage to upgrade. Press **+/-** buttons to select the available storage.

- **Upgrade File** – press **ENTER** to start the upgrade process when the highlighted file is a correct upgrade file. A confirmation dialog will be shown on the screen, press **ENTER** to confirm to upgrade the system software.

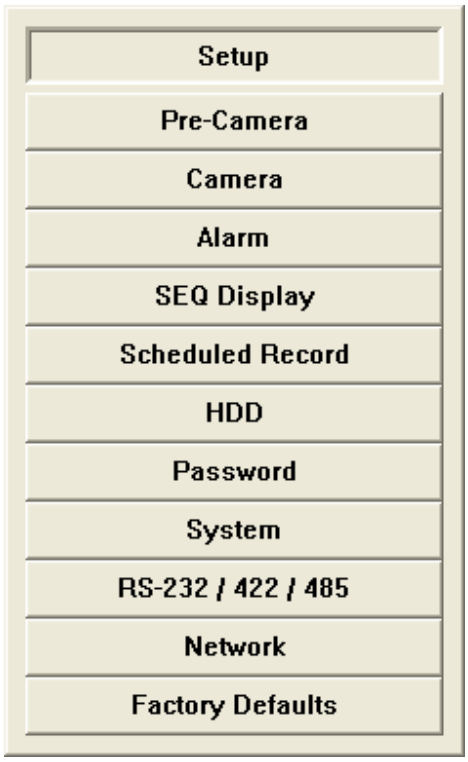
Note : After the software is upgraded, you will need to restart the system. Please follow the screen message to restart the system immediately.

5.6 System Shutdown (Administrator)

In Menu display, turn the Jog Dial or press ▲▼ to change the highlighted option to **Shutdown**, and then press **ENTER** to shutdown the system. A confirmation dialog will be shown on the screen, press **ENTER** to confirm the shutdown. The system will save all the files and all the states, and then display a power-off message in the rolling screen message area. The user may power off the system safely when the power-off message is shown.

6. Setup (Administrator)

In Menu display, turn the Jog Dial or press ▲▼ to change the highlighted option to **Setup**, and then press **ENTER** to call up Setup Menu display as shown. (To enter Setup Menu display of the system, please login as Administrator first.)



The user's operations are described as the followings:

- **Jog Dial**
  Turn the Jog Dial or press ▲▼ to change the highlighted item.

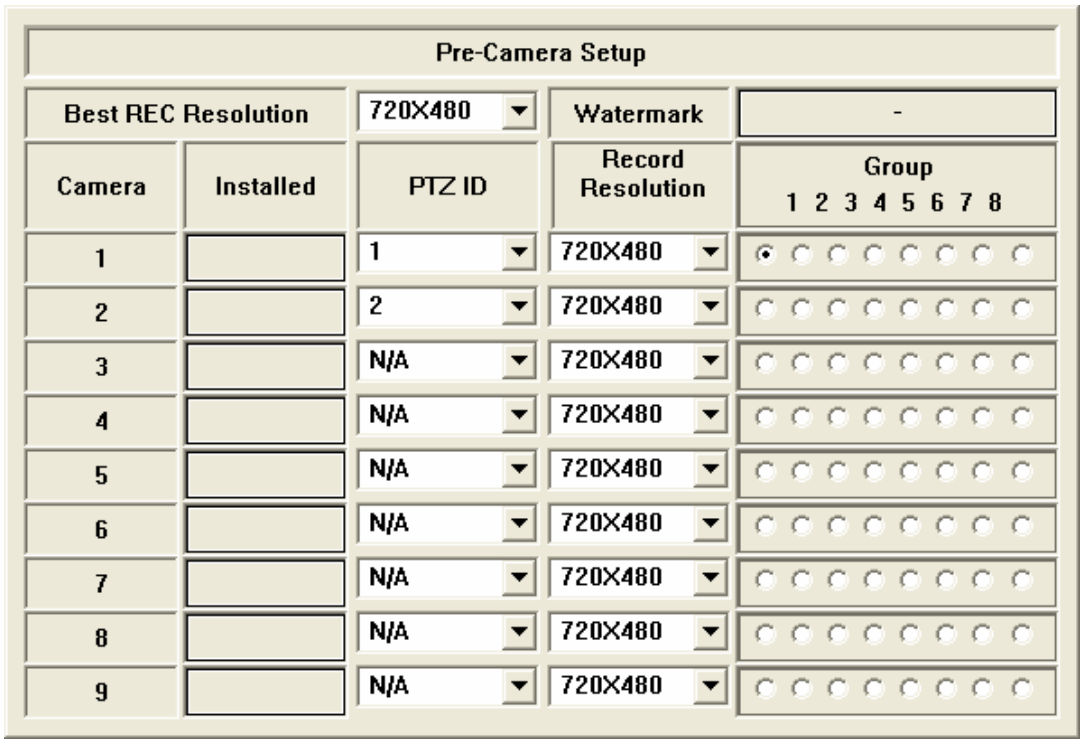
- **ENTER**
  Press this button to enter the setup of the highlighted option. For the details of each option, please refer to the following sections.

- **ESC**
  Press this button to escape from Setup Menu display, and return to Menu display.

If the user wants to reset all the settings to factory default values, he/she may turn the **Jog Dial** or press ▲▼to change the highlighted option to **Factory Defaults**, and then press **ENTER**. A confirmation dialog will be shown, press **ENTER** again to make the changes, **ESC** to not do it.

6.1 Pre-Camera Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼ to change the highlighted option to **Pre-Camera**, and then press **ENTER** to call up Pre-Camera Setup display as shown.



There are up to 16, 9, or 4 cameras which can be connected to the system. The Pre-Camera Setup allows the administrator to define some fundamental attributes, which may relate one camera to the others, for all the installed cameras.

The general operations are as below:

- Shuttle Jog
  Turn the Jog/Shuttle or press ▲▼◄► to select the items. The display will scroll up/down if the selected item is not shown on the screen.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the contents have been modified, a Save dialog will be shown to ask the user to save the changes, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Best REC Resolution** – the best record resolution for all the cameras in the system. For NTSC, it can be 720x480, 720x240, or 360x240; for PAL, 720x576,

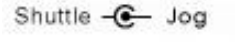
720x288, or 360x288. Press **+/-** buttons to select the resolution. The default setting is 720x480 for NTSC or 720x576 for PAL.

- **Watermark** – to record with digital watermark or not. If yes, all the recorded images for all the cameras will have digital watermark embedded. Press **ENTER** to check/uncheck this item. The default setting is "˅" - checked.

- **Installed** – whether this camera is installed or not. If installed, the following items will be settable. Press **ENTER** to check/uncheck this item. The default setting is "˅" - checked.

- **PTZ ID** – the PTZ ID of this camera if it's a PTZ camera. The PTZ ID has to be consistent with the setting of this camera. Please refer to the manual of the camera for the ID setting. Press **+/-** buttons to change the value (N/A or 0-255). The default setting is "**N/A**" – Not Available, which means that it's not a PTZ camera.

- **Record Resolution** – the record resolution for the camera. For this system, it's the same as the **Best REC Resolution** of the system.

- **Group** – the group which the camera belongs to if its record resolution is 360x240 or 360x288. It's used to maximize the record capacity of the system. Please refer to the table below for the maximum number of cameras in a group. None-selectable groups will be disabled and grayed. Please turn 

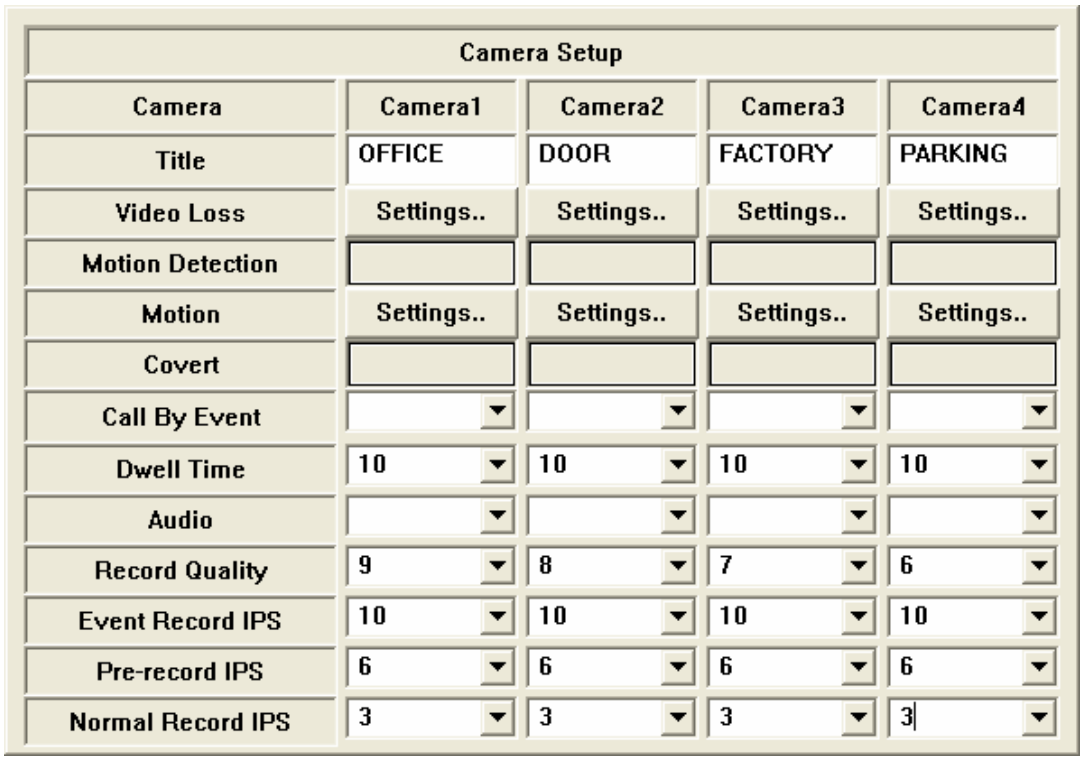
buttons to highlight the group, and then press **ENTER** to select the group of the camera.

TV system	Best Record Resolution	Record Resolution	Max. number of cameras in a group
NTSC	720x480	720x480	N/A
	720x240	720x240	N/A
	360x240	360x240	**2**
PAL	720x576	720x576	N/A
	720x288	720x288	N/A
	360x288	360x288	**2**

Please note that the cameras in the same group will have the same record attributes such as record quality, record IPS, etc.

6.2 Camera Setup

In Setup Menu display, turn **Jog Dial** or press ▲▼ to change the highlighted option to **Camera**, and then press **ENTER** to call up Camera Setup display as shown.



Camera Setup				
Camera	Camera1	Camera2	Camera3	Camera4
Title	OFFICE	DOOR	FACTORY	PARKING
Video Loss	Settings..	Settings..	Settings..	Settings..
Motion Detection				
Motion	Settings..	Settings..	Settings..	Settings..
Covert				
Call By Event				
Dwell Time	10	10	10	10
Audio				
Record Quality	9	8	7	6
Event Record IPS	10	10	10	10
Pre-record IPS	6	6	6	6
Normal Record IPS	3	3	3	3

The Camera Setup allows the administrator to define the attributes for each camera. There are up to 16, 9, or 4 cameras which can be connected to the system.

The general operations are as below:

- Shuttle Jog
  Turn the Jog/Shuttle or press ▲▼◄►to select the items. The display will scroll left/right if the selected item is not shown on the screen.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Title** – The title (Max. 8 characters) of this camera. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Video Loss Settings** – used to setup the action settings when video loss is

detected for this camera. Press **ENTER** in **Settings..** to call up Video Loss Setup display for the camera. Please refer to section 6.2.1 for the details.

- **Motion Detection** – whether the motion detection of this camera is enabled or not. If enabled, the next item **Motion Settings..** will be settable. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" **-** checked.

- **Motion Settings..** – used to setup the motion settings for this camera. Press **ENTER** in **Settings..** to call up Motion Setup display for the camera. Please refer to section 6.2.2 for the details.

- **Covert** – covert or not. If the camera is covert, the video of this camera can only be seen if the user has logged in as Administrator. Press **ENTER** to check/uncheck this item. The default setting is "**–**" **-** unchecked.

- **Call By Event** – whether to switch the call monitor to the video of this camera if certain event occurs for this camera. There are 4 options, including Off, Motion, Alarm, Both (Motion & Alarm). Press **+/-** buttons to select one.

- **Dwell Time** – the dwell time if **Call By Event** is set to Motion, Alarm, or Both. Press **+/-** buttons to adjust the value (3-60 seconds, discrete).

- **Audio** – the AUDIO IN corresponding to this camera. The audio data for the selected AUDIO IN will be recorded with the video data for this camera. Press **+/-** buttons to select none (N/A) or one of the AUDIO Inputs (1-4). The default setting is "N/A".

- **Record Quality** – the record quality for this camera. Press **+/-** buttons to select the value (1-9, with 1 the lowest (rough) quality, 9 the highest (fine) quality).

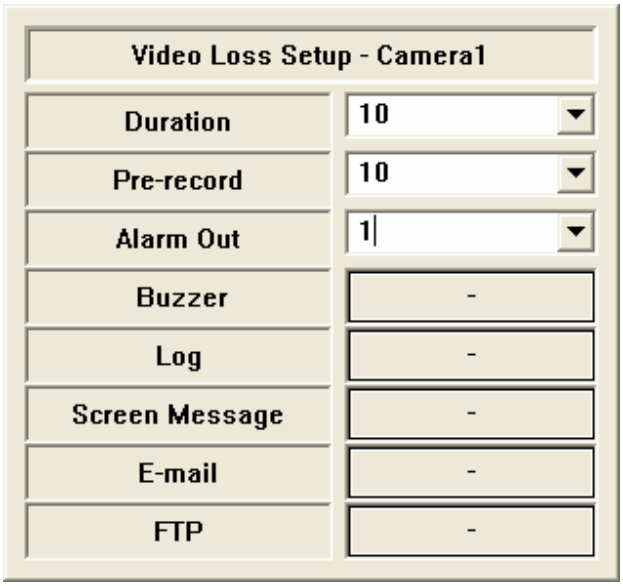
- **Event Record IPS** – the IPS (Images Per Second) for this camera if certain event (Motion, Alarm) occurs for this camera. This camera will be recorded at this rate for Post-record time since the event occurs. (Please refer to the following sections for Post-record time.) Press **+/-** buttons to select the value (0 – 25 (PAL) / 30 (NTSC), discrete).

- **Pre-record IPS** – the pre-record IPS for this camera if certain event (Video Loss, Motion, Alarm) occurs for this camera. This camera is recorded at this rate for Pre-record time before the event occurs. (Please refer to the following sections for Pre-record time.) Press **+/-** buttons to select the value (0 – **Event Record IPS** for this camera, discrete).

- **Normal Record IPS** – the normal record IPS for this camera. This camera will be recorded at this rate if no event occurs. Press **+/-** buttons to select the value (0 – **Pre-record IPS** for this camera, discrete).

6.2.1 Video Loss Setup

In Camera Setup, press **ENTER** to call up Video Loss Setup of the selected camera as shown when the highlighted option is **Video Loss Settings..** of the camera to setup. The Video Loss Setup allows the administrator to define how the system responds to the detected video loss for the camera.



The general operations are as below:

-
  Turn the **Jog Dial** or press ▲▼ to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Camera Setup display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Duration** – response duration to define at most how long (in seconds) the Alarm Out relay and the Buzzer will keep being triggered after video loss is detected for this camera. However, the Alarm Out relay and the Buzzer will be reset immediately once the camera returns to normal. Press **+/-** buttons to adjust the value (3-60 seconds, discrete).

- **Pre-record** – to define how long before video loss is detected this camera shall be intensively recorded at Pre-record IPS. Press **+/-** buttons to adjust the value (0-60 seconds, discrete). Please note that the actual pre-record time may be shorter than the value set if the total size of the pre-record pictures exceeds the pre-record buffer size of the system.

- **Alarm Out** – to define which Alarm Output will be triggered when video loss of this camera is detected. Press **+/-** buttons to select none (N/A) or one of the Alarm Outputs (1-4).

- **Buzzer** – to activate the internal Buzzer or not when video loss of this camera is detected. Press **ENTER** to check/uncheck this item. The default setting is "**v**" - checked.

- **Log** – to log to event logs or not. Press **ENTER** to check/uncheck this item.

The default setting is "˅" - checked.

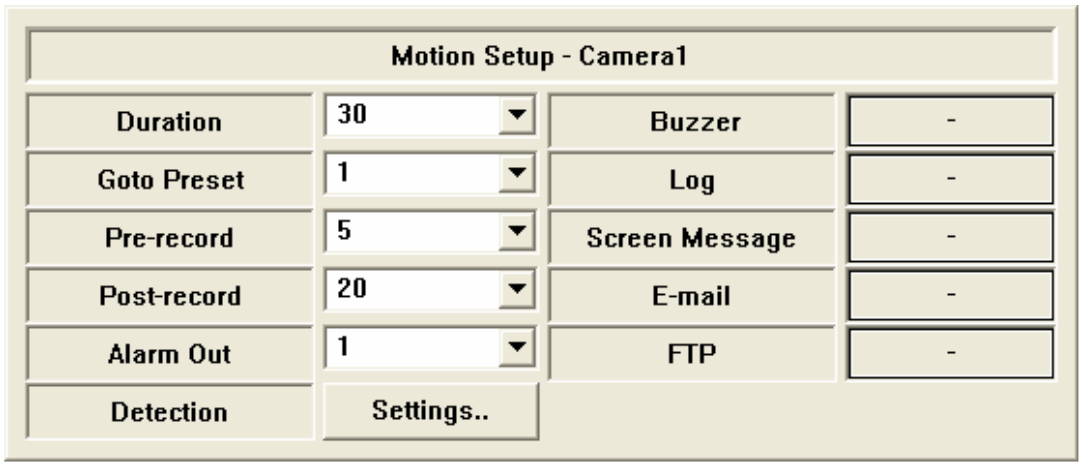
- **Screen Message** – to display the event message on the screen or not. Press **ENTER** to check/uncheck this item. The default setting is "˅" - checked.

- **E-mail** – to send the event e-mail to remote station or not. The e-mail will be sent to the predefined receivers at the moment when the event is triggered. Press **ENTER** to check/uncheck this item. The default setting is "–" - unchecked.

- **FTP** – to send the recorded event video/audio files to FTP server or not. Press **ENTER** to check/uncheck this item. The default setting is "–" - unchecked.

6.2.2 Motion Setup

In Camera Setup, press **ENTER** to call up Motion Setup as shown when the highlighted option is **Motion Settings..** of the camera to setup. The Motion setup allows the administrator to define how the system responds to the detected motion for the camera.



The general operations are as below:

-

Turn the **Jog**/**Shuttle** or press ▲▼◄► to select the items.

- **ESC**
Press this button to escape from this screen, and return to Camera Setup display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Duration** – response duration to define at most how long (in seconds) the Alarm Out relay and the Buzzer will keep being triggered after motion is detected for this camera. However, the Alarm Out relay and the Buzzer will be reset immediately once the camera returns to normal. Press **+/-** buttons to adjust the value (3-60 seconds, discrete).

- **Goto Preset** – to define the preset position to go to if motion is detected and this camera is a PTZ camera. For more details about preset locations, please refer to Chapter 7 PTZ Control.

- **Pre-record** – to define how long before motion is detected this camera shall be intensively recorded at Pre-record IPS. Press **+/-** buttons to adjust the value (0-60 seconds, discrete). Please note that the actual pre-record time may be shorter than the value set if the total size of the pre-record pictures exceeds the pre-record buffer size of the system.

- **Post-record** – to define how long after motion is detected this camera shall be intensively recorded at Event Record IPS. Press **+/-** buttons to adjust the value (0 second - 60 minutes, discrete).

- **Alarm Out** – to define which Alarm Output will be triggered when motion of this camera is detected. Press **+/-** buttons to select none (N/A) or one of the Alarm Outputs (1-4).

- **Buzzer** – to activate the internal Buzzer or not when motion of this camera is detected. Press **ENTER** to check/uncheck this item. The default setting is "˅" - checked.

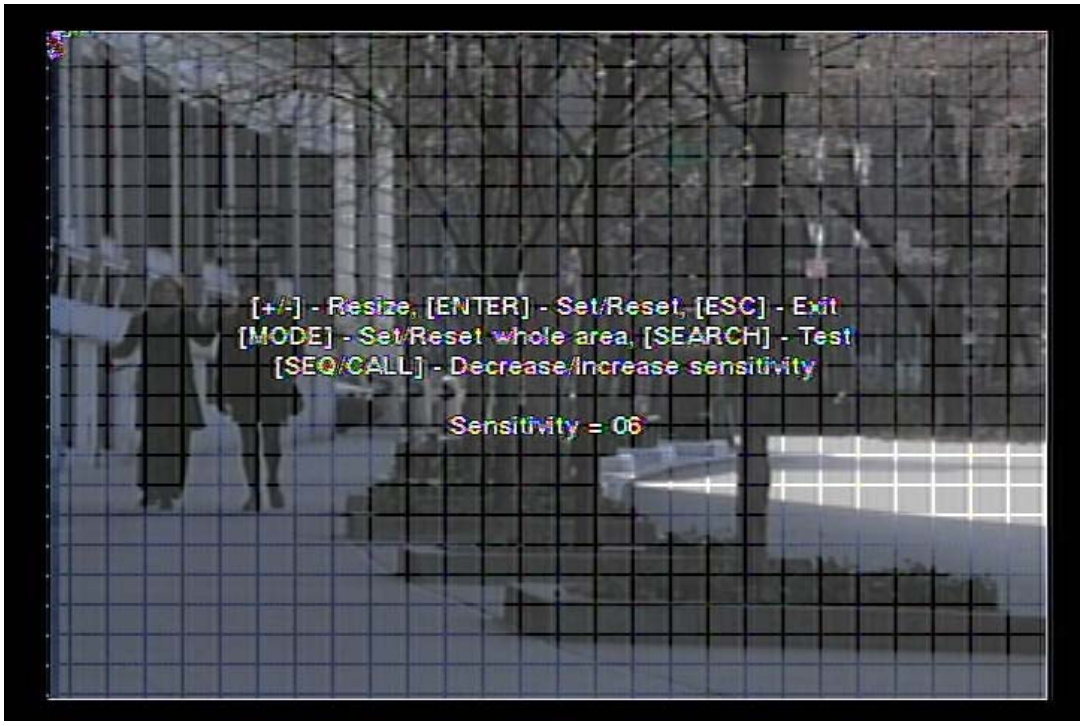
- **Log** – to log to event logs or not. Press **ENTER** to check/uncheck this item. The default setting is "˅" - checked.

- **Screen Message** – to display the event message on the screen or not. Press **ENTER** to check/uncheck this item. The default setting is "˅" - checked.

- **E-mail** – to send the event e-mail to remote station or not. The e-mail will be sent to the predefined receivers at the moment when the event is triggered. Press **ENTER** to check/uncheck this item. The default setting is "**–**" - unchecked.

- **FTP** – to send the recorded event video/audio files to FTP server or not. Press **ENTER** to check/uncheck this item. The default setting is "**–**" - unchecked.

- **Detection Settings..** – used to setup the motion detection settings, including detection area and sensitivity, when motion is detected for this camera. Press **ENTER** in **Settings..** to call up Motion Detection Setup (as shown) for this camera. In Motion Detection Setup, the video area is divided into many small grids, and the area with grids shown one the screen is the area which will be detected for motion. Besides, there is a Mask window surrounded by a highlighted frame border.


[+/-] - Resize, [ENTER] - Set/Reset, [ESC] - Exit
[MODE] - Set/Reset whole area, [SEARCH] - Test
[SEQ/CALL] - Decrease/Increase sensitivity
Sensitivity = 06

Following is a brief description for the operations:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press▲▼◄► to move the Mask window.

- **+/-**
  Press these buttons to resize the Mask window.

- **ENTER**
  Press this button to set/reset the area under the Mask window.

- **MODE**
  Press this button to set/reset the whole video area.

- **SEQ**
  Press this button to decrease the sensitivity, from 10 – 1, for the motion detection of this camera.

- **CallII**
  Press this button to increase the sensitivity, from 1 – 10, for the motion detection of this camera.

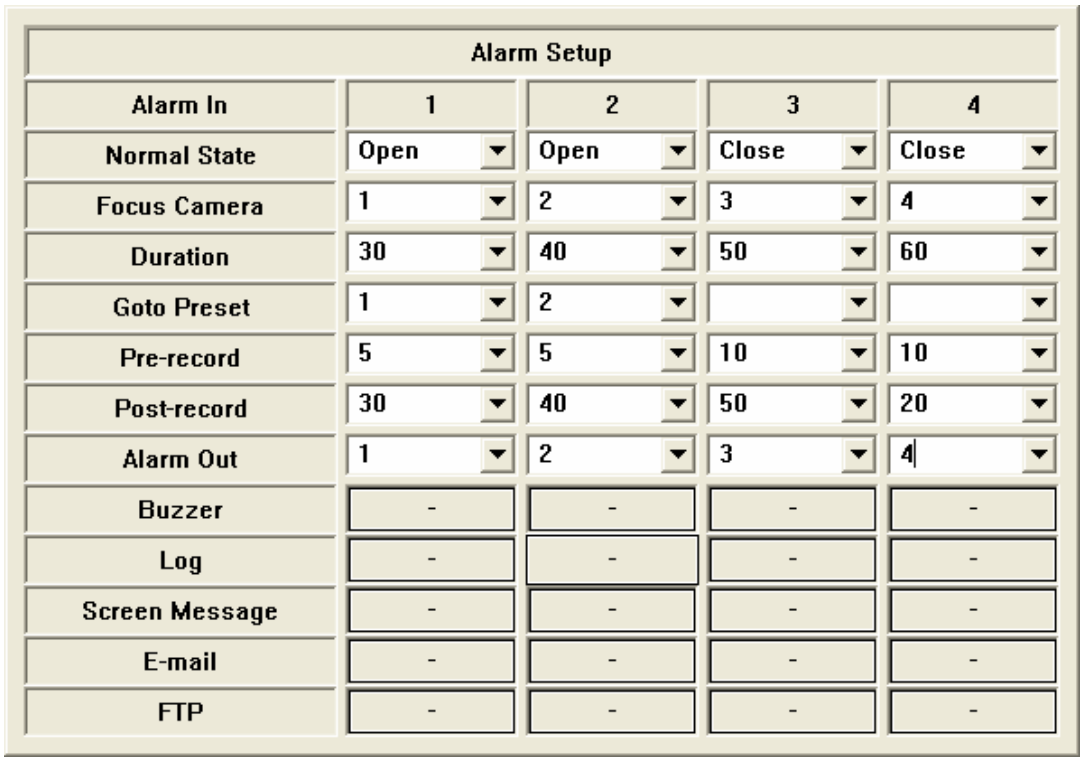
- **SEARCH**
  Press this button to test the motion detection of this camera. The detected motion will be shown on the screen. Press this button again to stop testing.

- **ESC**

Press this button to escape from Motion Detection Setup, and return to Motion Setup.

6.3 Alarm Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼to change the highlighted option to **Alarm**, and then press **ENTER** to call up Alarm Setup display as shown. The Alarm Setup allows the administrator to define the attributes for each alarm input, and the actions if it's triggered. There are up to 16 alarm inputs which can be connected to the system.


Alarm Setup
Alarm In 1 2 3 4
Normal State Open Open Close Close
Focus Camera 1 2 3 4
Duration 30 40 50 60
Goto Preset 1 2
Pre-record 5 5 10 10
Post-record 30 40 50 20
Alarm Out 1 2 3 4
Buzzer - - - -
Log - - - -
Screen Message - - - -
E-mail - - - -
FTP - - - -

The general operations are as below:

- Shuttle Jog

  Turn the **Jog**/**Shuttle** press▲▼◄► to select the items. The display will scroll left/right if the selected item is not shown on the screen.

- **ESC**

  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Normal State** – press **+/-** buttons to select **N/A**, **Close** or **Open**. Please check the signal type, normally close or normally open, connected to the alarm input terminal on the rear panel of the system. If there's no signal connected, please select **N/A** – Not Available, and the following items will not be settable. The default setting is **N/A**.

- **Focus Camera** – the camera corresponding to this alarm input.

- **Duration** – response duration to define at most how long (in seconds) the Alarm Out relay and the Buzzer will keep being triggered after this alarm input is triggered. However, the Alarm Out relay and the Buzzer will be reset immediately once this alarm input returns to normal. Press **+/-** buttons to adjust the value (3-60 seconds, discrete).

- **Goto Preset** – to define the preset position to go to for the Focus Camera if this alarm input is triggered and the Focus Camera is a PTZ camera. For more details about preset locations, please refer to Chapter 7 PTZ Control.

- **Pre-record** – to define how long before this alarm input is triggered the Focus Camera shall be intensively recorded at Pre-record IPS. Press **+/-** buttons to adjust the value (0-60 seconds, discrete). Please note that the actual pre-record time may be shorter than the value set if the total size of the pre-record pictures exceeds the pre-record buffer size of the system.

- **Post-record** – to define how long after this alarm input is triggered the Focus Camera shall be intensively recorded at Event Record IPS. Press **+/-** buttons to adjust the value (0 second - 60 minutes, discrete).

- **Alarm Out** – to define which Alarm Output will be triggered when this alarm input is triggered. Press **+/-** buttons to select none (N/A) or one of the Alarm Outputs (1-4).

- **Buzzer** – to activate the internal Buzzer or not when this alarm input is triggered. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

- **Log** – to log to event logs or not. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

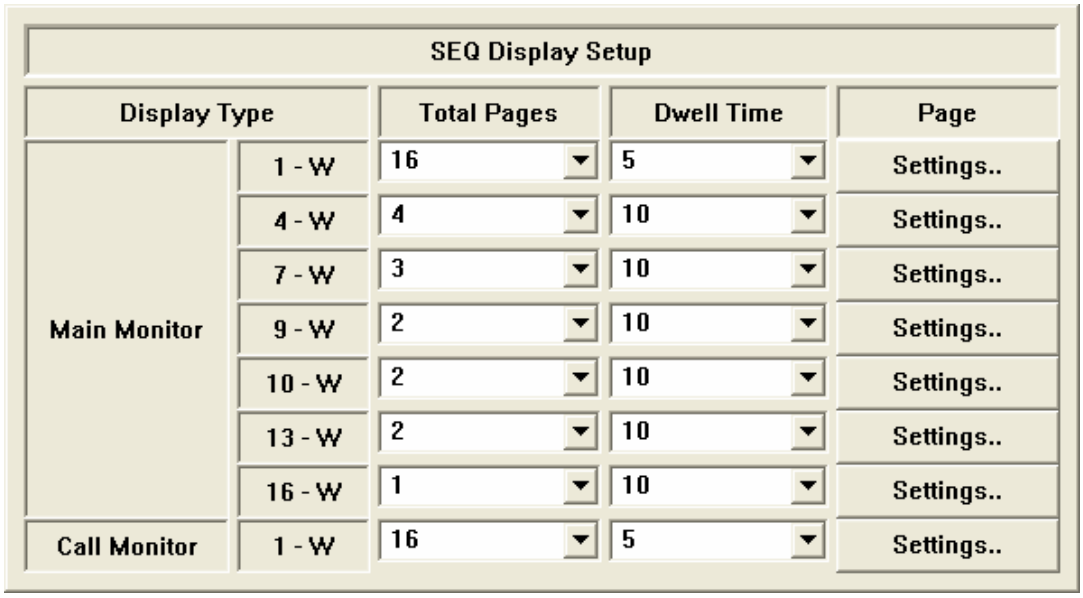
- **Screen Message** – to display the event message on the screen or not. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

- **E-mail** – to send the event e-mail to remote station or not. The e-mail will be sent to the predefined receivers at the moment when the event is triggered. Press **ENTER** to check/uncheck this item. The default setting is "**–**" - unchecked.

- **FTP** – to send the recorded event video/audio files to FTP server or not. Press **ENTER** to check/uncheck this item. The default setting is "**–**" - unchecked.

6.4 SEQ Display Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼ to change the highlighted option to **SEQ Display**, and then press **ENTER** to call up SEQ Display Setup as shown.



The SEQ Display Setup allows the administrator to define the display pages in SEQ Display for main monitor and call monitor. There are up to 7 display types - 1-Window, 4-Window, 7-Window, 9-Window, 10-Window, 13-Window and 16-Window - for main monitor, and 1 display type for call monitor.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press▲▼◄► to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Total Pages** – total pages for this SEQ Display Type. The maximum number varies according to the display type. Press **+/-** buttons to select the desired number from the available list.

- **Dwell Time** – the dwell time (3 ~ 60 seconds, discrete) for each page of this display type. Press **+/-** buttons to change the value.

- **Page Settings..** – used to set the camera in each viewing window for each page of this SEQ Display Type. Press **ENTER** to call up Display Page Setup as shown.

In Display Page Setup, the split window display for the current page is shown. And the title of the camera for the focus window is highlighted. Following is a brief description for the operations:

- Shuttle Jog

  Turn the **Jog**/**Shuttle** or press ▲▼◄► to move the focus window.

- **Numeric (ENTER)**

  Press these buttons to change the camera for the focus window.

- **+/-**

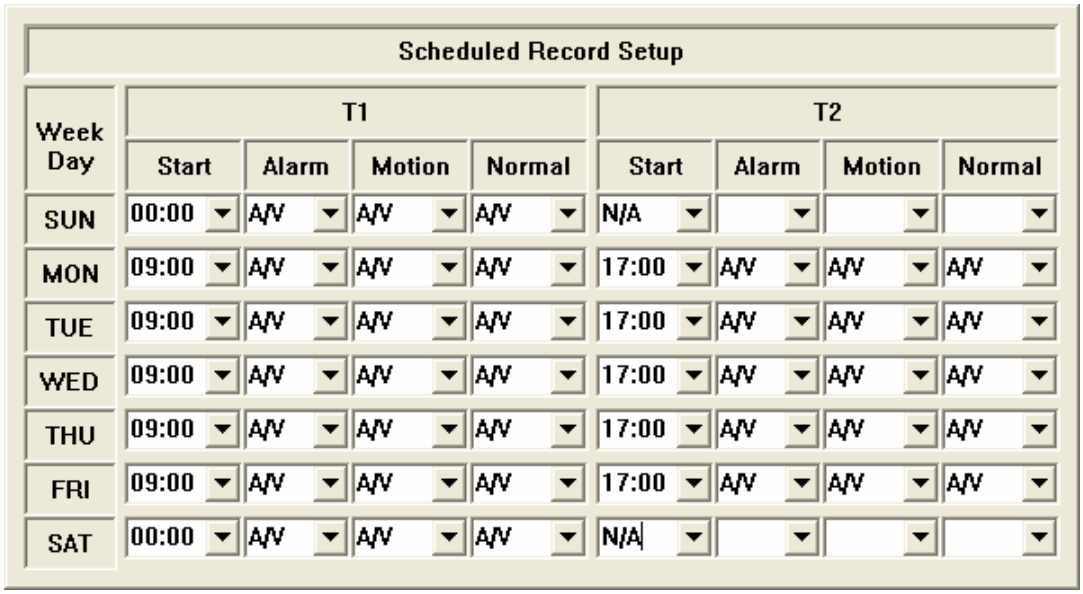
  Press these buttons to change the current page for this SEQ Display Type.

- **ESC**

  Press this button to escape from Display Page Setup, and return to SEQ Display Setup.

6.5 Scheduled Record Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼to change the highlighted option to **Scheduled Record**, and then press **ENTER** to call up Scheduled Record Setup as shown.


Scheduled Record Setup
Week Day
T1
T2
Start
Alarm
Motion
Normal
SUN 00:00 A/V A/V A/V N/A
MON 09:00 A/V A/V A/V 17:00 A/V A/V A/V
TUE 09:00 A/V A/V A/V 17:00 A/V A/V A/V
WED 09:00 A/V A/V A/V 17:00 A/V A/V A/V
THU 09:00 A/V A/V A/V 17:00 A/V A/V A/V
FRI 09:00 A/V A/V A/V 17:00 A/V A/V A/V
SAT 00:00 A/V A/V A/V N/A

The Scheduled Record Setup allows the administrator to define when and how to record for the system. There are up to 16 time segments (T1 – T16) for each weekday.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog/Shuttle** or press ▲▼◄► to select the items. The display will scroll left/right if the selected item is not shown on the screen.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Start** – the start time of this time segment, increment at 30 minutes. (The end time of this time segment is implicitly set as the start time of next time segment, or the start time of the first time segment of the same weekday if it's the last one.) Press **+/-** buttons to select the desired start time.

  Example: If the user sets the start time of T1/MON at 9:00, T2/MON at 18:00, T3-T16/MON at N/A (Not Available), then T1/MON is 9:00-18:00,

T2/MON is 0:00-9:00, and 18:00-24:00.

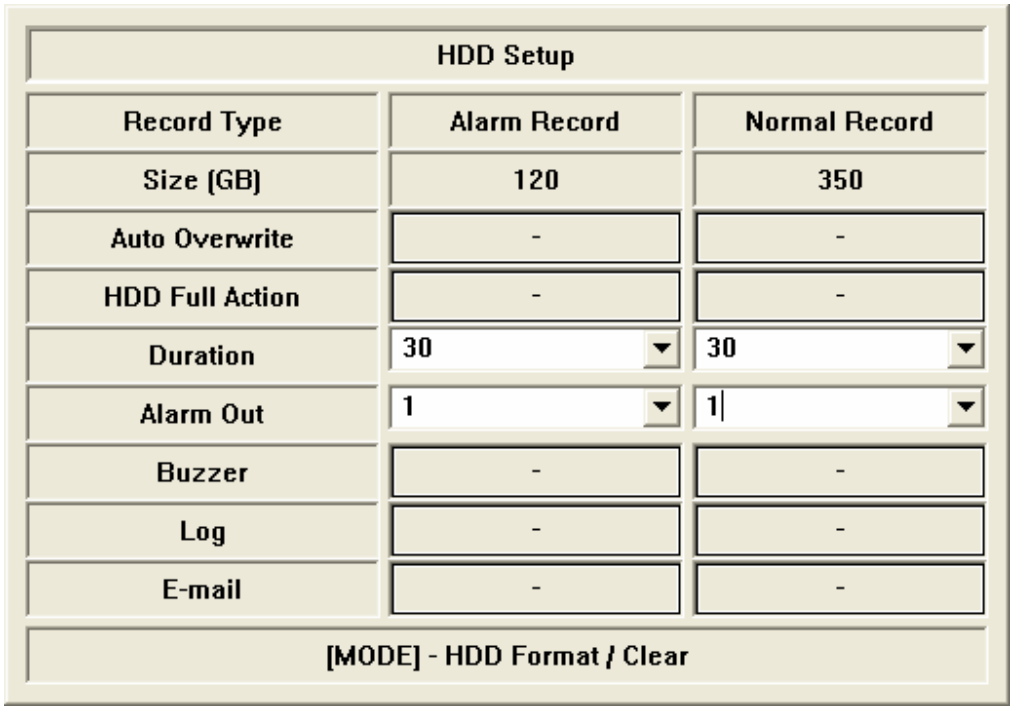
- **Alarm** – record mode (No, Video, or Audio/Video) when certain alarm input is triggered. Press **+/-** buttons to change the value.

- **Motion** – record mode (No, Video, or Audio/Video) when motion is detected for certain camera. Press **+/-** buttons to change the value.

- **Normal** – normal record mode, including No, V (Video only), or A/V (Audio/Video). Press **+/-** buttons to change the value.

6.6 HDD Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼ to change the highlighted option to **HDD**, and then press **ENTER** to call up HDD Setup as shown.



In the surveillance applications, alarm video/audio is much more important than normal video/audio. So, this digital video/audio recorder is designed to allow the user to divide each HDD into alarm partition and normal partition. And, alarm video/audio will be recorded in alarm partition, normal video/audio in normal partition.

The HDD Setup allows the administrator to format/clear each HDD, set Alarm Record size and Normal Record size of each HDD, and define the behaviors for Alarm Record and Normal Record if it reaches the end of the last HDD in the system.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press ▲▼◄► to select the items.

- **MODE** => Format/Clear
  Press this button to format/clear the HDDs as described in Section 6.6.1.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without

saving.

Following is a brief description for each item and its specific operations:

- **Size (GB)** – the total HDD storage in GB (Giga-Byte) for Alarm Record and Normal Record respectively. This item is just for information. Please refer to Section 6.6.1 for more detailed information and setup of each individual HDD.

- **Auto Overwrite** – automatic overwrite of the recorded video/audio from HDD#1 when the Alarm/Normal Record disk drive capacity reaches the end of the last HDD. If Auto Overwrite is disabled and the Alarm/Normal Record disk drive capacity reaches the end, the system will not overwrite the recorded video/audio, and hence not record Alarm/Normal video/audio, until the user presses the **Alarm Reset** button. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

- **HDD Full Action** – actions when Alarm/Normal Record disk drive capacity reaches the end of the last HDD. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

- **Duration** – response duration to define at most how long (in seconds) the Alarm Out relay and the Buzzer will keep being triggered after the corresponding partition, Alarm Record or Normal Record, is full. Press **+/-** buttons to adjust the value (3-60 seconds, discrete).

- **Alarm Out** – to define which Alarm Output will be triggered when the corresponding partition, Alarm Record or Normal Record, is full. Press **+/-** buttons to select none (N/A) or one of the Alarm Outputs (1-4).

- **Buzzer** – to activate the internal Buzzer or not when the corresponding partition, Alarm Record or Normal Record, is full. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

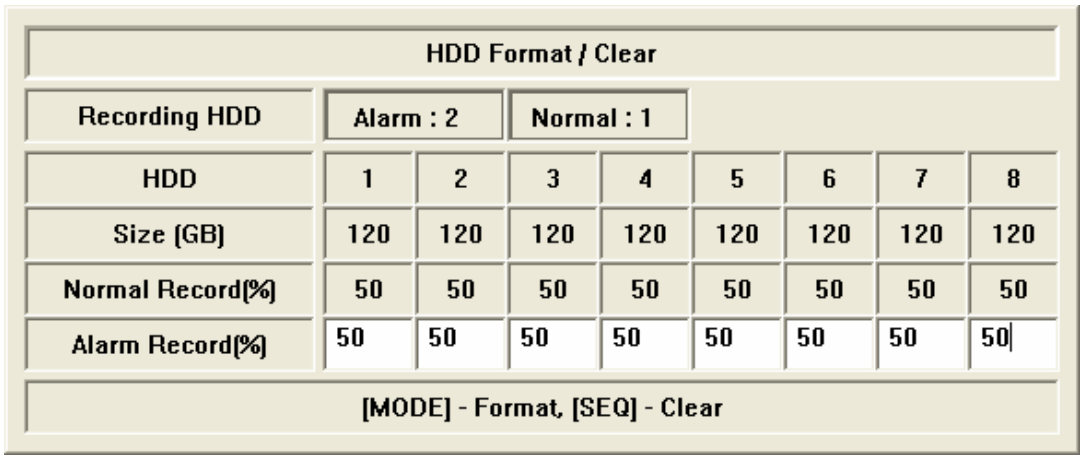
- **Log** – to log to event logs or not. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

- **Screen Message** – to display the event message on the screen or not. Press **ENTER** to check/uncheck this item. The default setting is "ˇ" - checked.

- **E-mail** – to send the event e-mail to remote station or not. The e-mail will be sent to the predefined receivers at the moment when the event is triggered. Press **ENTER** to check/uncheck this item. The default setting is "**–**" - unchecked.

6.6.1 HDD Format/Clear

In HDD Setup display, press **MODE** to call up HDD Format/Clear screen as shown.


HDD Format / Clear
Recording HDD
Alarm : 2
Normal : 1
HDD
1 2 3 4 5 6 7 8
Size (GB)
120 120 120 120 120 120 120 120
Normal Record(%)
50 50 50 50 50 50 50 50
Alarm Record(%)
50 50 50 50 50 50 50 50
[MODE] - Format, [SEQ] - Clear

Each of the HDDs must be formatted before it can be used to record video/audio. The HDD Format/Clear screen allows the administrator to format and/or clear each HDD, and set the size for Alarm Record partition and Normal Record partition for each HDD.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog/Shuttle** or press ▲▼◄► to select the items. The display will scroll left/right if the selected item is not shown on the screen.

- **MODE** => Format
  Press this button to format the selected HDD. A confirmation dialog will be shown on the screen, press **ENTER** to confirm, or **ESC** to cancel. **Please note that it would take about 30 seconds to format a brand new HDD.**

  Note: If the HDD has not been formatted yet, it will be formatted and partitioned with default record size, 30% for Alarm record and 70% for Normal record. If it has been formatted before, it will be formatted according to the Alarm REC Size (%) and Normal REC Size (%) displayed on the screen, but the previously recorded contents within the new size won't be cleared and will be accessible.

- **SEQ** => Clear
  Press this button to clear the selected HDD. A confirmation dialog will be shown on the screen, press **ENTER** to confirm, or **ESC** to cancel.

  Note: If the HDD has not been formatted yet, it will be formatted and partitioned with default record size, 30% for Alarm record and 70% for Normal record. If it has been formatted (and recorded) before, it will

be partitioned according to the Alarm Record Size (%) and Normal Record Size (%) displayed on the screen, and the previously recorded contents will all be cleared.

- **ESC**
  Press this button to escape from this screen, and return to HDD Setup display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Alarm Recording HDD** – the current HDD for alarm recording. This item is just for information.

- **Normal Recording HDD** – the current HDD for normal recording. This item is just for information.

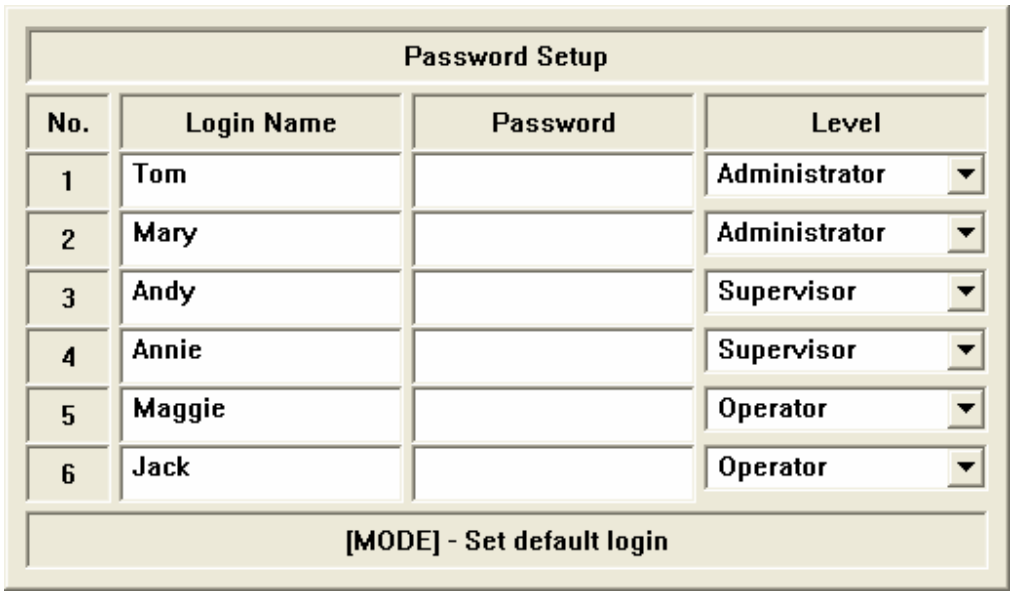
- **Size (GB)** – the total storage in GB (Giga-Byte) for this HDD if it has been formatted. This item is just for information.

- **Alarm Record(%)** – Alarm Record Size (in percentage) for this HDD. Please follow the Text Input method described in Section 4.1 to change the value.

- **Normal Record(%)** – Normal Record Size (in percentage) for this HDD. It equals to (100% - Alarm Record Size). This item is just for information.

6.7 Password Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼ to change the highlighted option to **Password**, and then press **ENTER** to call up Password Setup as shown.



The Password Setup allows the administrator to add new users, delete existing ones, and/or modify the user's name, password, and/or level.

There are three password levels in the system, including **Administrator** (highest), **Supervisor**, and **Operator** (lowest). The Operator can operate live video display, the Supervisor live video display, image playback and archive, and the Administrator everything. The system allows up to 18 user accounts.

There is one factory-preset login name/password aa/11 at **Administrator** level. The user can use it to login the system for the first time.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press▲▼◄► to select the items. The display will scroll up/down if the selected item is not shown on the screen.

- **MODE** => **Select/Deselect as default**
  Press this button to select this user as the default one at login, or deselect if this user is the default login user. An asterisk (*) will be shown preceding the number for the default login user. And this login name/password will be the default one each time the login dialog is shown, so the user doesn't bother to enter the text to login the system.

- **ESC**

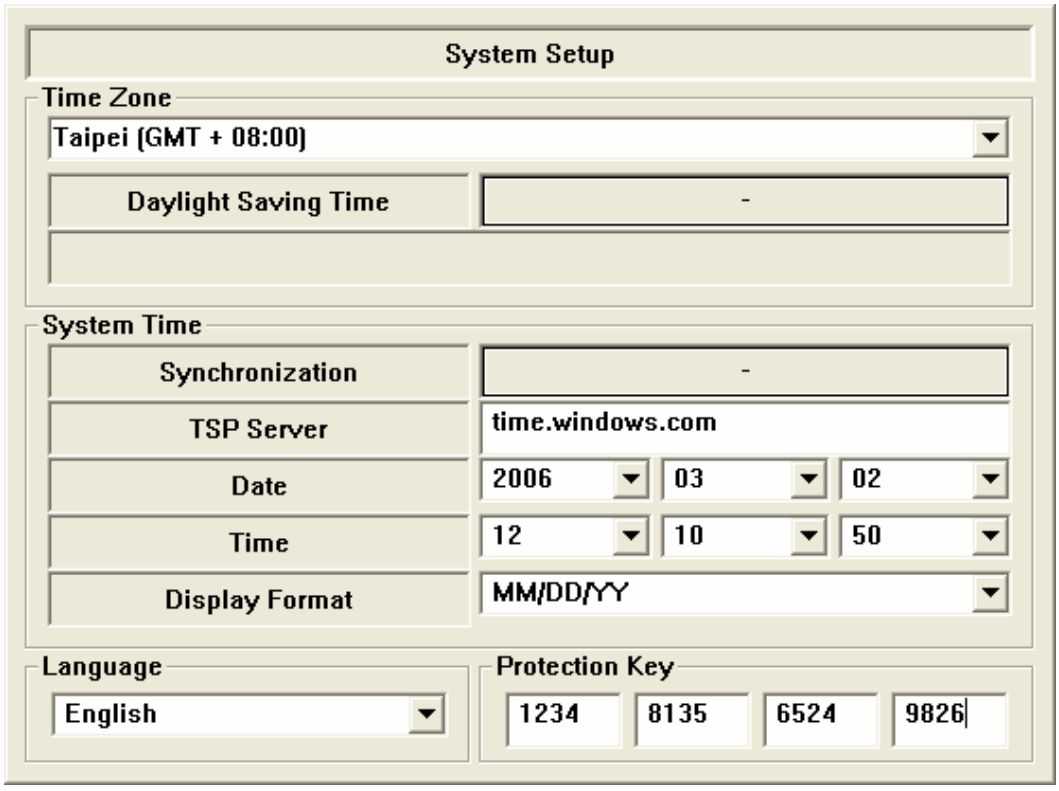
Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Login Name** – please follow the Text Input method described in Section 4.1 to modify this item.
- **Password** – this item accepts numbers only. Please follow the Text Input method described in Section 4.1 to modify this item.
- **Level** – the password level (**Administrator**, **Supervisor**, or **Operator**) for this user. Press **+/-** buttons to change the level.

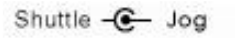
6.8 System Setup

In Setup Menu display, turn the **Jog Dial** or press▲▼ to change the highlighted option to **System**, and then press **ENTER** to call up System Setup as shown.



The System Setup allows the administrator to set the system time, time zone, time synchronization, language, etc.

The general operations are as below:

- 

Turn the **Jog**/**Shuttle** or press ▲▼◄► to select the items.

- **ESC**
Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving. **Please note that if the selected language is changed, the user will be asked to reboot the system for the newly selected language to take effect.**

Following is a brief description for each item and its specific operations:

- **Time Zone** – press **+/-** buttons to select the time zone for the system. Please refer to Appendix C for the time zone table.

- **Daylight Saving Time** – press **ENTER** to check/uncheck this item. The default value is set by selecting a different time zone, but the user may check/uncheck this item if the default setting is checked.

- **System Time** –

  - **Synchronization** – time synchronized with TSP Server or not. Press **ENTER** to check/uncheck this item. The default setting is "**–**" - unchecked.

  - **TSP Server** – TSP (Time Synchronization Protocol) server name if Time Synchronization is enabled. The system will try to do time synchronization with the specified TSP server at the system preset interval. Please follow the Text Input method described in Section 4.1 to modify this item.

  - **Date** – system date. Press **+/-** buttons to modify each of these items.

  - **Time** – system time. Press **+/-** buttons to modify each of these items.

  - **Display Format** – format used for the system time displayed on the lower-left corner of the main screen. Press **+/-** buttons to select the desired format.

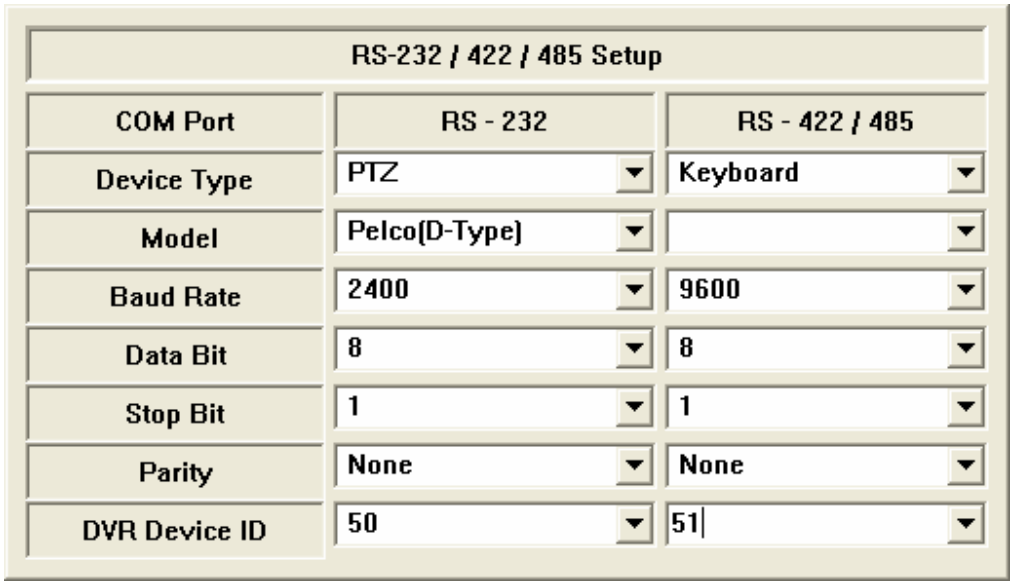
- **Language** – press **+/-** buttons to select the language for the system.

- **Protection Key** – the protection key for the remote access of the system. Please follow the Text Input method described in Section 4.1 to modify these items.

  Note: This protection key will be used for authentication when any remote station wants to connect with the system from Ethernet interface, either LAN or Internet. So, the same protection key must be entered to install the remote software if it is to be used to access the system.

6.9 RS-232/422/485 Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼ to change the highlighted option to **RS-232/422/485**, and then press **ENTER** to call up RS-232/422/485 Setup as shown.



The RS-232/422/485 Setup allows the administrator to setup RS-232 control port, and RS422 or RS-485 control port. Please refer to the manuals for the connected devices - PTZ cameras or keyboard controllers – to set these items in RS-232/422/485 Setup.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press ▲▼◄►to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Device Type** – **PTZ**, **Keyboard**, or **N/A** (Not Available). Press **+/-** buttons to change the type.

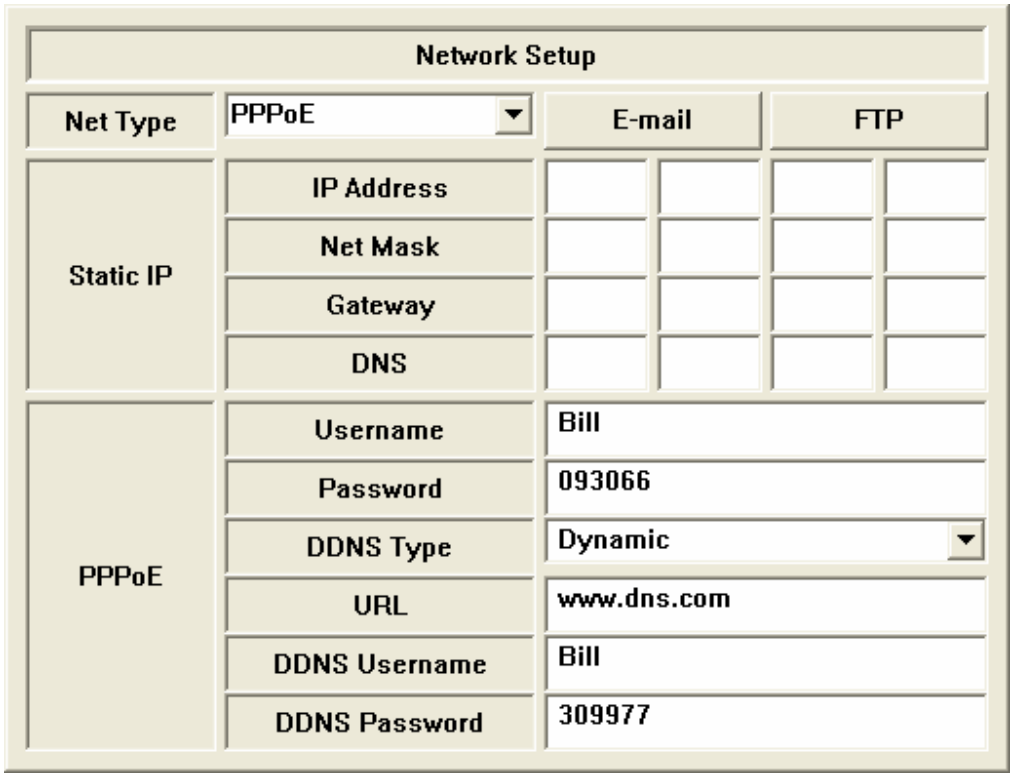
- **Model** – PTZ model or Keyboard model of the connected devices. The PTZ models supported include Auviss ASD Series Speed Dome (AUVISS D Type, Default), Pelco D protocol Dome, SamSung SCC-641P, Kalatel Cyber Dome,

PIH-series, Dynacolor, etc. Press **+/-** buttons to change the supported model.

- **Baud Rate** – press **+/-** buttons to change the value.
- **Data Bit** – press **+/-** buttons to change the value.
- **Stop Bit** – press **+/-** buttons to change the value.
- **Parity** – (**Odd**, **Even**, or **None**). Press **+/-** buttons to change the value.
- **DVR Device ID** – the device ID for this digital video/audio recorder. This field must not conflict with the other devices connected in the same control port. Press **+/-** buttons to change the ID.

6.10 Network Setup

In Setup Menu display, turn the **Jog Dial** or press ▲▼ to change the highlighted option to **Network**, and then press **ENTER** to call up Network Setup as shown.



The Network Setup allows the administrator to setup all Ethernet network related parameters. Please check with your network administrator to set these parameters correctly.

The general operations are as below:

- Shuttle Jog
  Turn the Jog/Shuttle or press ▲▼◄► to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Setup Menu display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **Net Type** – Static IP, PPPoE, or DHCP. DHCP can only be used for intranet (LAN) access, while Static IP and PPPoE can be used for both internet & intranet access. Press **+/-** buttons to change the Net Type.

- **IP Address** – Ethernet IP address for the system. To get the static IP address, please contact your local ISP (Internet Service Provider). Please follow the Text Input method described in Section 4.1 to modify these items.

- **Net Mask** – Net Mask for the IP address. Please follow the Text Input method described in Section 4.1 to modify these items.

- **Gateway** – Gateway IP address for the system. Please follow the Text Input method described in Section 4.1 to modify these items.

- **DNS** – DNS (Domain Name Server) IP address for the system. Please follow the Text Input method described in Section 4.1 to modify these items.

- **Username** – PPPoE username for the system if PPPoE is used. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Password** – PPPoE password for the system if PPPoE is used. Please follow the Text Input method described in Section 4.1 to modify this item.

- **DDNS Type** – Dynamic, Static, or Custom DDNS (Dynamic Domain Name Server) type. Please contact your local DDNS Service Provider to get the DDNS URL, username, and password. Press **+/-** buttons to change this item.

- **URL** – the URL (Uniform Resource Locators) for the system if PPPoE is used. Please follow the Text Input method described in Section 4.1 to modify this item.

- **DDNS Username** – DDNS username for the system if PPPoE is used. Please follow the Text Input method described in Section 4.1 to modify this item.

- **DDNS Password** – DDNS password for the system if PPPoE is used. Please follow the Text Input method described in Section 4.1 to modify this item.

- **E-mail** – press **ENTER** to call up E-mail Setup. Please refer to section 6.10.1 for the details.

- **FTP** – press **ENTER** to call up FTP Setup. Please refer to section 6.10.2 for the details.

6.10.1 E-mail Setup

In Network Setup, press **ENTER** to call up E-mail Setup as shown when the highlighted option is **E-mail**.

E-mail Setup	
SMTP Server	www.smtp.com
Authentication	-
Username	Steven
Password	Steven
Mail From	dvr1@dvr1.com
Mail To #1	charles@auviss.com
Mail To #2	
Mail To #3	
Mail To #4	
Mail To #5	

The E-mail Setup allows the administrator to set e-mail related parameters. When an event occurs and E-mail is enabled for the corresponding action, an e-mail will be sent based on the parameters set here.

The general operations are as below:

-
  Turn the **Jog Dial** or press ▲▼to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Network Setup display. If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **SMTP Server** – SMTP mail server name. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Authentication** – whether the SMTP mail server requires authentication.

Press **ENTER** to check/uncheck this item.

- **Username** – username if the SMTP mail server requires authentication. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Password** – password if the SMTP mail server requires authentication. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Mail From** – the e-mail address of this DVR unit, i.e. the sender of the e-mails originated from the triggered events. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Mail To #1-5** – the receivers' e-mail addresses. The system can send the e-mails originated from the triggered events to up to 5 different receivers. Please follow the Text Input method described in Section 4.1 to modify these items.

6.10.2 FTP Setup

In Network Setup, press **ENTER** to call up FTP Setup as shown when the highlighted option is **FTP**.

The FTP Setup allows the administrator to set FTP related parameters. When an event occurs and FTP is enabled for the corresponding action, the recorded video/audio for that event will be sent to the FTP server based on the parameters set here.

The general operations are as below:

-
  Turn the **Jog Dial** or ▲▼to select the items.

- **ESC**
  Press this button to escape from this screen, and return to Network Setup display.

If the Save dialog is shown, press **ENTER** to exit and save, **ESC** to exit without saving.

Following is a brief description for each item and its specific operations:

- **FTP Server** – FTP server web/IP address. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Username** – username for this DVR unit in the FTP server. Please follow the Text Input method described in Section 4.1 to modify this item.

- **Password** – password for this DVR unit in the FTP server. Please follow the Text Input method described in Section 4.1 to modify this item.

7. PTZ Control

The digital video/audio recorder supports a variety of PTZ cameras. The user can easily control the PTZ cameras through the operations described in this Chapter if those PTZ cameras have been connected and setup correctly. Please refer to Section 3.2 Optional Connections for the connections. Please refer to Section 6.1 Pre-Camera Setup to set the PTZ ID of each PTZ camera, and Section 6.9 RS-232/422/485 Setup to setup the control port.

If a camera is also a PTZ camera, there will be an asterisk (*) preceding its title in its video window in split-window display. Please press **PTZ** button to enter PTZ control mode if the focus camera is a PTZ camera. The asterisk (*) will be changed to inverse color to indicate that the camera is now in PTZ control mode.

In PTZ control mode, the user's operations can be divided into general operations and miscellaneous function specific operations, and are described as the followings:

General operations:

- **PTZ**
  Press this button to exit PTZ control mode. The asterisk (*) will be changed back to normal color.

- **▲▼**
  Press these buttons to tilt the camera up/down.

- **◄►**
  Press these buttons to pan the camera left/right.

- **Zoom +/-**
  Press these buttons to zoom in/out the lens.

- **Focus +/-**
  Press these buttons to focus near/far the lens.

- **GOTO**
  Press this button to move the camera to the preset position. Press numeric buttons **0-9** to enter the number of the preset position to move the camera to.

- **SET**
  Press this button to set the preset position. Press numeric buttons **0-9** to enter the number of the desired preset position of the camera.

- **NEXT**
  Press this button for the next miscellaneous function. The miscellaneous functions include Focus, Iris, Auto PAN, SEQ, Preset, and Pan Speed. And the active one will be shown on the lower right corner of the screen. The miscellaneous function specific operations are described in the following table.

Miscellaneous function specific operations:

Active function	Operations	Descriptions
Focus	**+/-** **ENTER**	**Focus far/near** **Auto focus**
Iris	**+/-**	Iris increase/decrease
Auto Pan (3)	 **+/-** **ENTER** * **#**	Auto pan speed is shown in parenthesis **Increase/decrease speed** **Start/stop Auto Pan** **Set start position** **Set end position**
SEQ (5 sec.)	 **+/-, NUMBER** **ENTER**	SEQ dwell time is shown in parenthesis. If SEQ mode is on, the camera will goto preset position 0-9 sequentially. **Change dwell time** **Start/stop SEQ mode, an asterisk (*) will be shown if SEQ mode is on**
Preset (1)	 **+/-, NUMBER** **ENTER**	Preset location is shown in parenthesis **Change Preset location** **Set Preset location**
Pan Speed (3)	 **+/-**	Manual pan speed is shown in parenthesis Increase/decrease speed

8. Search/Playback/Archive (Administrator, Supervisor)

There are three ways to search the recorded video/audio for playback:
(a) Search by time,
(b) Search by event, and
(c) Search archived files.

In split-window display, press **SEARCH** button repeatedly, and the supported Search displays will be shown on the screen in sequence for the user to search the recorded video/audio. The Search displays and their operations are described in the following sections, followed by the playback operations of the searched video/audio.

8.1 Search By Time

The screen for Search By Time is shown below:

The general operations are as below:

■
Turn the **Jog Dial** or press ▲▼to select the items.

- **ESC**
  Press this button to escape from this screen, and return to split-window display.

- **SEARCH**
  Press this button to switch to the next Search display.

- **MODE**
  Press this button to start searching the recorded video/audio with the selected search time and video/audio type. The search result will be shown on the bottom of this dialog if it failed. **Please note that there must be some cameras in playback mode for the search to succeed.**

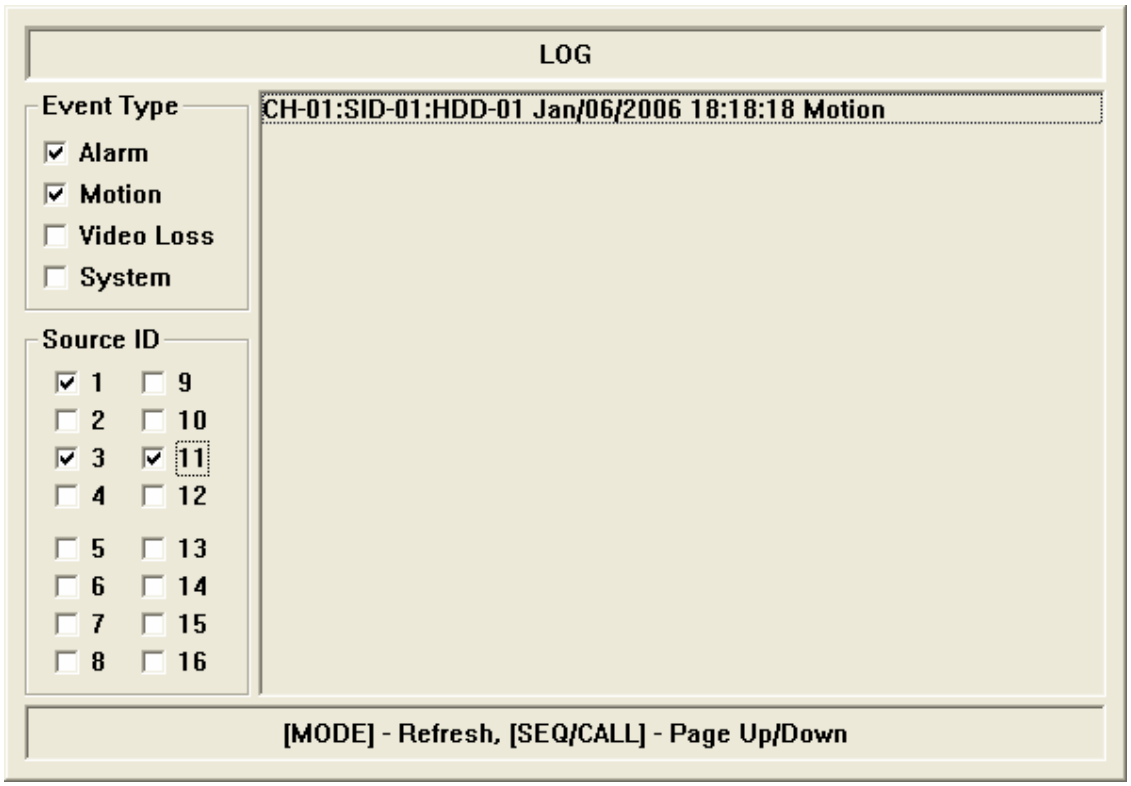
Following is a brief description for each item and its specific operations:

- **Search Time** – (**Year**, **Month**, **Date**, **Hour**, **Minute**) for the recorded video/audio. The playback will start from the time entered here when the user press the playback buttons later. Press **+/-** buttons to modify each item.

- **Video**/**Audio** – (**Alarm**, **Motion**, **Video Loss**, **Normal**). Check the types of the recorded video/audio you want to search for playback. Press **ENTER** to check/uncheck each item.

8.2 Search By Event / Log Display

The screen for Search By Event - Log display, is shown below:



There are four different types of event logs, including Alarm, Motion, Video Loss, and System. And up to 3000 most recent event logs can be stored in the system.

The general operations are as below:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press ▲▼◄► to select the items.

- **ESC**
  Press this button to escape from this screen, and return to split-window display.

- **SEARCH**
  Press this button to switch to the next Search display.

- **MODE** => Refresh
  Press this button to refresh the log display. If there are new event logs after the screen is last updated, the log list shown will be updated accordingly.

- **SEQ** => Page Up
- **CALL** => Page Down
  Press **SEQ**/**CALL** to Page Up/Down the Log display.

Following is a brief description for each item and its specific operations:

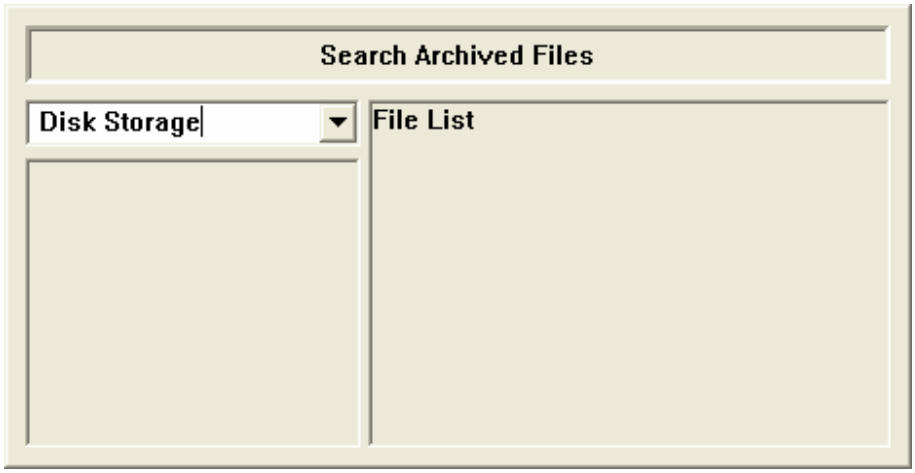
- **Event Type** – the type of the events (**Record**, **Alarm**, **Motion**, **Video Loss**, **System**) to be shown in the log list. The Event Type "System" includes all system related events, such as power on/off, and will not trigger recording. Press **ENTER** to check/uncheck the event type for the log list.

- **Source ID** – the source which triggered the event. For Alarm, it's the alarm input number; for Motion and Video Loss, it's the camera number. It's used to filter the events to be shown in the log list. Press **ENTER** to check/uncheck each item.

- **Log List** – the event logs according to the Event Type and Source ID selected. Press **ENTER** to enter Event Playback display of the selected event log in this list. Please refer to Section 8.5 Playback For Search By Event for the detailed operations for event playback.

8.3 Search Archived Files

The screen for Search Archived Files is shown below:



The operations are as below:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press ▲▼◄► to select the items.

- **ESC**
  Press this button to escape from this screen, and return to split-window display.

- **SEARCH**

Press this button to switch back to split-window display.

Following is a brief description for each item and its specific operations:

- **Disk Storage** – to select the disk storage to search the archived files. Press **+/-** buttons to select the available storage.

- **Archived File List** – the archived files in the selected Disk Storage. Please select the file, and then press **ENTER** to enter Archived File Playback display of the selected file in this list. Please refer to Section 8.6 Playback For Archived Files for the detailed operations.

Note : The format of the filename is camNN-YYYYMMDD-hhmmss.m4v, where NN stands for camera number, YYYY year, MM month, DD date, hh hour, mm minute, and ss second.

8.4 Playback/Archive for Search By Time

In split-window display, press **MODE** button to change circularly the live/playback mode for the focus window and the other windows that form a rectangle on the screen. The video windows for the windows in playback mode are grayed, while those in live mode display live video.

Please refer to Section 4.3 Basic Operations for how to change the camera(s) in the playback windows(s). After the playback windows and cameras are all set as you want, you may use the following buttons to control the playback:

- **Play/Pause Button (▶/Ⅱ)**
  Press this button to play the recorded video/audio searched at forward speed 1X, or pause the playback. If the playback is paused, press this button again to resume playing. Note that audio can only be played at forward speed 1X.

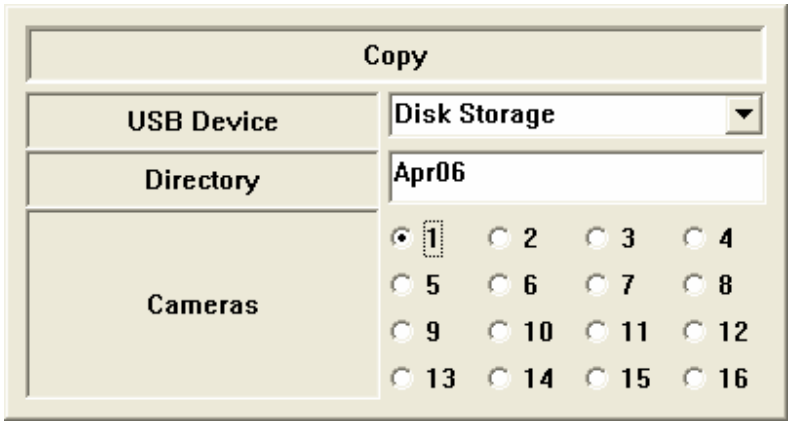
- **Stop Button** (■)
  Press this button to stop playing the recorded video/audio. If the user press ▶/Ⅱ button later, the playback will start from the beginning.

- **Fast Forward (Shuttle)**
  Turn the Shuttle Ring clockwise for fast forward playback, the forward playback speed will become faster, from 2X, 4X, 8X, up to 16X.

- **Fast Backward (Shuttle)**
  Turn the counterclockwise for fast backward playback, the backward playback speed will become faster, from 2X, 4X, 8X, up to 16X.

- **Single Step Button (⏭)**
  Press this button to play the recorded images frame by frame.

- **Copy Button**
  Press this button to copy the playback video/audio to the storage device connected to the USB port. The Copy display will be shown as below.



Following is a brief description for the operations in Copy display:

- Shuttle Jog
  Turn the **Jog**/**Shuttle** or press ▲▼◄►to select the items.

- **ESC**
  Press this button to escape from this screen, and return to the previous display. There will be a **Copy** icon on the lower-right corner indicating that the playback video/audio will be archived to the storage device. Press **Copy** again to stop copying, and the **Copy** icon will be disappeared.

The description for each item and its specific operations is as below:

- **USB Device** – the USB device connected to the system. Press **+/-** buttons to select the device. **Please follow the steps described in Section 5.3 USB to connect the USB device before copying.**

- **Directory** – the directory in the USB device to store the archived files. Please follow the Text Input method described in Section 4.1 to input the directory.

- **Cameras** – the video/audio of the cameras to be archived. Press **ENTER** to select one of the cameras.

Except the playback buttons, the user can still do all the other operations in split-window display as if there is no playback. Please refer to Section 4.3 Basic Operations for the operations of the other buttons.

8.5 Playback/Archive For Search By Event

In Log display, press **ENTER** to enter Event Playback display of the selected event log. This display is the same as full screen display of the main display, and the playback buttons are effective.

The operations are as below:

- **Playback Buttons (▶/⏸, ■, Shuttle Jog , ⏭,Copy)**
  These buttons, Jog/Shuttle are all the same as in Section 8.4 Playback/Archive For Search By Time.

- **The Other Buttons**
  All the other buttons are the same as in Section 4.3 Basic Operations.

8.6 Playback for Archived Files

In Search Archived Files display, press **ENTER** to enter Archived File Playback display of the selected file. This display is the same as full screen display of the main display, and the playback buttons are effective.

The operations are as below:

- **Playback Buttons (▶/⏸, ■, Shuttle Jog , ⏭)**
  These buttons are all the same as in Section 8.4 Playback/Archive For Search By Time. Please note that **COPY** button is not effective in this display.

- **The Other Buttons**
  All the other buttons are the same as in Section 4.3 Basic Operations.

9. Remote Access

The digital video/audio recorder can be accessed by using a web browser installed on a PC if this unit is connected to a network, either internet or intranet.

Before Logging On

Before accessing this unit through web browser, please make sure the followings:

1. This unit is connected to the network correctly, and the configurations are all setup correctly. Please refer to Section 6.10 Network Setup for the detailed configurations.

2. **DirectX® End-User Runtime 9.0** or above has been installed in your PC successfully. If not, please logon to http://www.microsoft.com to get the free download of it.

3. **DivX® Play 6.x** has been installed in your PC successfully. If not, please logon to http://www.divx.com to get the free download of it.

4. The **domain name or IP address** of the digital video/audio recorder has been set as **trusted web site** in your PC. If not, please go to Tools->Options->Security in your I.E. to do the settings.

5. The **ActiveX control** in your PC is not disabled. If you are not sure, please go to Tools->Options->Security->Custom in your I.E. to enable ActiveX control.

6. Please go to Start->Setup->Control, select Display->Settings, and set the Screen Resolution to at least **1024x768** and Color to **32-bit**.

7. **Port 67** (control port) or **port 68** (data port) is not blocked out by your router or ISP (Internet Service Provider).

8. If the PC has used I.E. to access earlier software version of DVR, please go to Tools->Options->General in your I.E. to delete “Temporary Internet files”.

9. To have better look-&-feel for your PC, please go to Start->Setup->Control, and select Display->Visual Style->Windows XP Style.

Logon

After the above-mentioned items have been done correctly, restart your web browser and enter the domain name or IP address of the digital video/audio recorder in the Location/Address field of the web browser. The plug-in software in the system will be downloaded and run automatically in the web browser.

After the plug-in software is downloaded and run in the web browser, you will be asked for ActiveX control to interact with your PC. Please select “Yes”, and the remote login display will be shown. For some PCs, it may be necessary to click in the window with the message in red color, but outside the Login Dialog before the next step. Please enter the correct login name and password for the digital video/audio recorder to login the system. And the main remote display will be shown as below.

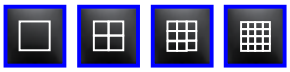
The video images can be displayed in several types of split-window screens, including 1-Window, 4-Window, 9-Window, and 16-Window. And the focus window is surrounded by a frame border. In addition to the video windows, there are different icons on the lower corner and the right corner of the screen for status display and control.

Note 1: If there’s any problem for video display, please set a lower quality level for the cameras (Section 6.2).

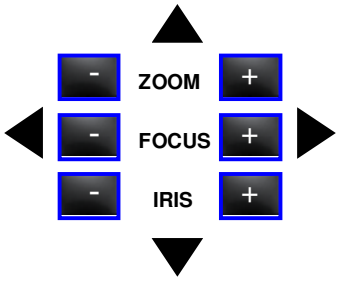
Note 2: If there’s any problem for 16-Window display, please select Settings->Control->Display on your PC, and then set the Color to 16-bit instead of 32-bit.

The operations and descriptions for these icons are as below:

- In video window, right-click the mouse button to call up Camera/Playback Dialog. (Left) click on Playback or Camera number to change the window to the corresponding camera and live/playback mode.



Click on these icons for 1-Window, 4-Window, 9-Window, and 16-Window display.



PTZ control panel. If the camera in the focus window is a PTZ camera, these buttons in the PTZ control panel can be used for PTZ control. The operations include Tilt Up/Down, Pan Left/Right, Zoom–(Out)/Zoom+(In), Focus –(Far)/Focus+(Near), Iris –(close)/Iris + (open).

Click on this icon to toggle between live mode and playback mode for the focus window.

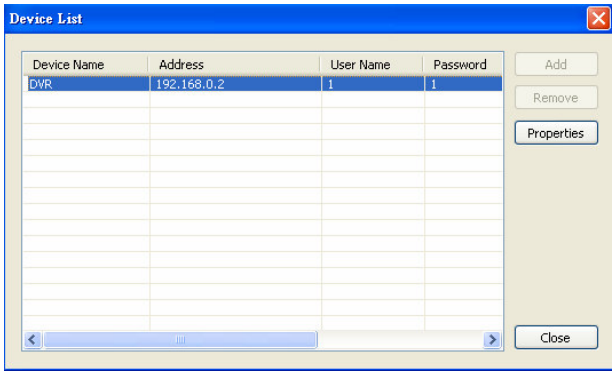
Click on this icon to call up Search-by-time dialog. Please select the time (Year, Month, Date, Hour, and Minute) and recorded video/audio type (Alarm, Motion, Video Loss, and Normal) to search for playback. Click on Search button to start the search of the recorded video/audio. (If it failed, the result will be shown on the title of the dialog.) Now, you may use the playback buttons to play the recorded video/audio. **Please note that there must be some cameras in playback mode for the search to succeed.**

Click on this icon to call up Search-by-event dialog. The event logs will be shown on the screen. Please select the event type and source ID to search for the event logs. Click on Refresh, Up, or Down to update the event logs. Click on the desired event log to highlight and select it. Click on the OK button to search the recorded video/audio for the highlighted event log. Now, you may use the playback buttons to play the recorded video/audio.

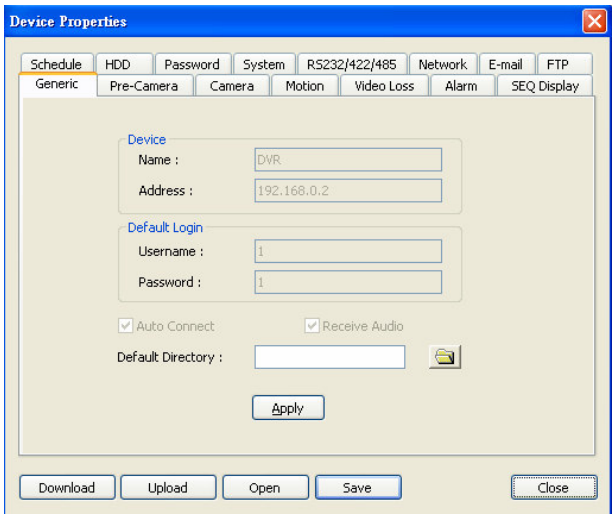
Click on this icon to call up search-PC-video dialog. Please select the file, and then click on Open. Now, you may use the playback buttons to play the recorded video/audio in the file.

Copy the “Live picture” or “Playback files” to PC.

Click this icon for the Device List. There will be a dialog shown as follows.



Click the Properties icon, there will be Device Properties shown as follow. Besides, the user can **download**/**upload** the configurations from/to the connected DVR, or **open**/**save** the configurations from/to the designated directory.



Click on this icon to freeze/unfreeze the video image in the focus window.

Click on this icon for miscellaneous PTZ control functions, including Preset, Goto, Auto Pan, etc. if the camera in the focus window is a PTZ camera.

Click on this icon to mute/not mute the audio output. (V2.00 or latest supported)

Click on this icon to mute/not mute the audio input. (V2.00 or latest supported)

Playback panel for playback buttons, including Fast Backward, Stop, Play, Single Step, Pause, Fast Forward (from left to right).

Camera

Status indicators for cameras 1-16 (GREEN for normal, RED for motion). Click on any of these icons to select the corresponding camera to be displayed in the focus window.

Alarm In

Status indicators for alarm inputs 1-16 (GREEN for normal, RED for alarm).

Alarm Out

Alarm outputs 1-4 (GREEN for normal state, RED for triggered state). Click on any of these icons to control the corresponding alarm output from normal to triggered, or from triggered back to normal.

System Requirements of Remote PC

It is recommended to access the digital video/audio recorder using a PC that meets the following system requirements. If you use a PC that does not meet the following system requirements, it may cause problems such as slow imaging or the browser unable to operate.

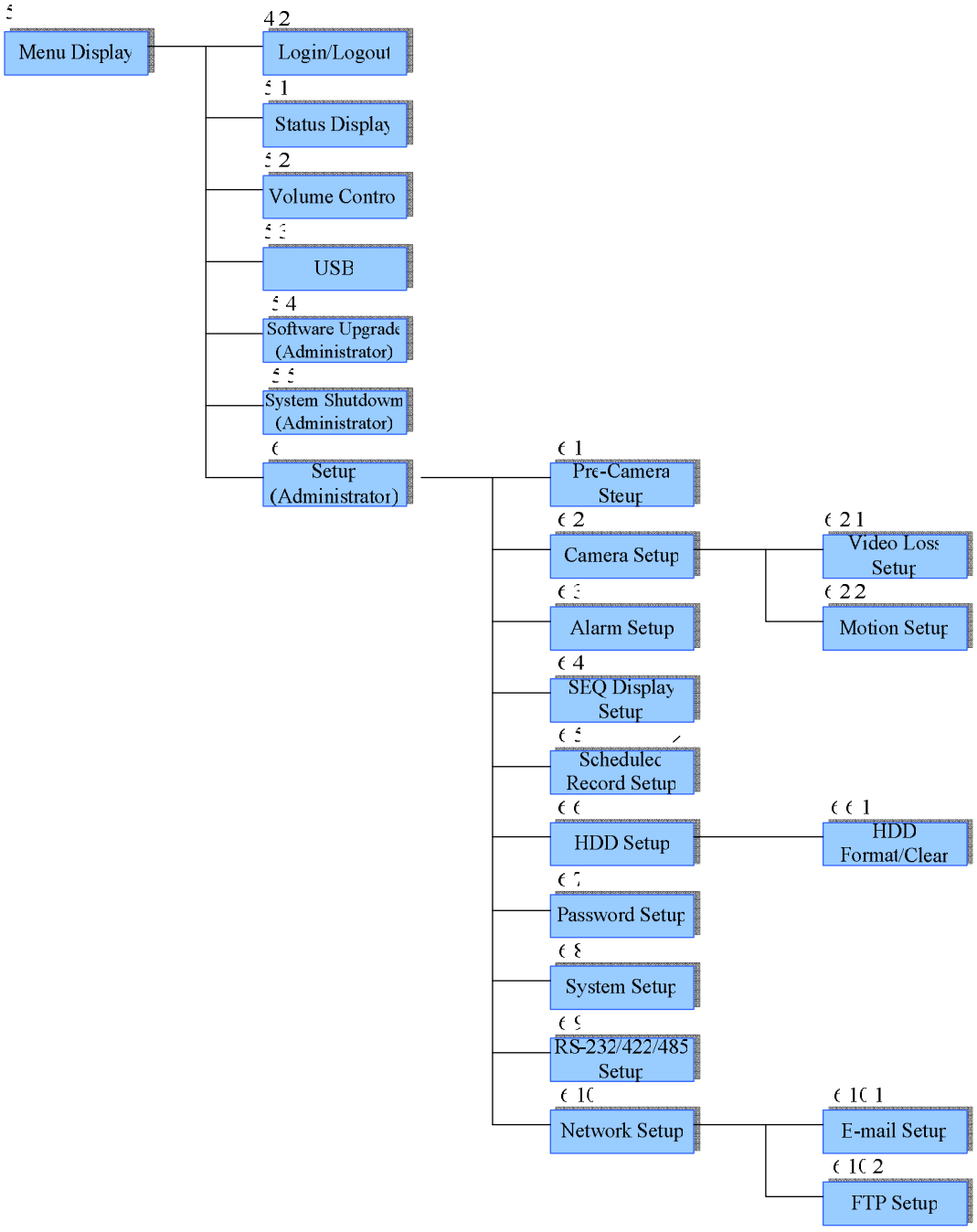
- **PC**
  IBM PC/AT compatible.
- **CPU**
  Intel® Pentium® 4, 1.4 GHz or above.
- **OS**
  MicroSoft® Windows® XP or Windows® 2000.
- **Monitor**
  1024 x 768 or above.
- **Network Interface**
  Ethernet, 10/100 Base-T.
- **Web Browser**
  MicroSoft® Internet Explorer® 5.0 or above.
- **DirectX**
  MicroSoft® DirectX® 9.0 or above.
- **Others**
  DivX® Play 6.x.

Appendix A – Specifications

Video	Format	NTSC/EIA or PAL/CCIR
	Input	AD416/216/116: 16-CH, BNC, 1Vp-p/75ohm AD209/109: 9-CH, BNC AD104: 4-CH, BNC
	Main monitor	BNC x 1, S-video x 1, 1Vp-p/75ohm
	Main-AUX	BNC x 2 (Input x 1, Output x 1), 1Vp-p/75ohm
	Call monitor	BNC x 1, 1Vp-p/75ohm
	Call-AUX	BNC x 2 (Input x 1, Output x 1), 1Vp-p/75ohm
	Loop-through	16/9/4-CH as Video Input, BNC, 1Vp-p/75ohm
	Loss detection	Yes
	Motion detection	Yes, with configurable detection area & sensitivity
Audio	Input	4 RCA-jack connectors
	Output	2 RCA-jack connectors
Record	Compression	Video: MPEG-4 Audio: ADPCM
	Frame rate (IPS) & Resolution	AD416: NTSC: (120) / 720*480, (240) / 720*240, (480) / 360*240, PAL: (100) / 720*576, (200) / 720*288, (400) / 360*288 AD216/209: NTSC: (60) / 720*480, (120) / 720*240, (240) / 360*240, PAL: (50) / 720*576, (100) / 720*288, (200) / 360*288 AD116/109/104: NTSC: (30) / 720*480, (600) / 720*240, (120) / 360*240, PAL: (25) / 720*576, (50) / 720*288, (100) / 360*288
	Watermark	Yes
	Mode	Manual/Schedule/Alarm/Motion
	Pre-record time	AD416: 0 - 30 seconds Others: 0 – 60 seconds
	Post-record time	0 - 60 minutes
Display	Resolution	NTSC – 720*480, PAL – 720*576
	Split windows	AD416/216/116: 1/4//7/9/10/13/16 AD209/109: 1/4/7/9 AD104: 1/4
	Frame rate	Up to 30 (NTSC) / 25 (PAL) IPS per display window
	Freeze	Yes
	Sequential switch	User adjustable
Playback	Frame rate (IPS) & Resolution	NTSC – 30 / 720*480, 60 / 720*240, 120 / 360*240 PAL – 25 / 720*576, 50 / 720*288, 100 / 360*288
	Search	Date/time, Camera, Alarm, & Motion
Storage	HDD	2 sets of 3.5” IDE type HDDs
	HDD Extension	1 optional IEEE 1394 connector for up to 32 HDDs (8 sets of ABox400)
	Backup	2 USB 2.0 ports for USB 2.0 disk drives, DVD+RW, card readers, etc.
Alarm	Input	16 contact or TTL/CMOS signal, polarity selectable
	Output	2 Normally Open, 2 Normally Closed relay output
	Buzzer	Yes
	Triggered by	Sensor input, Video loss, & Motion
	Event log	Yes

Network	Ethernet	1 RJ-45 10/100BaseT Ethernet connector
	Web	Remote setup, monitoring, & alarm notification
	E-mail	Alarm notification to stationary or mobile devices
	FTP	Alarm video/audio file storage
	Protocol	TCP/IP, HTTP, PPPoE, DHCP, DDNS, FTP, TSP
Control	I/R	1 I/R remote controller to control up to 4 DVRs
	RS-232	1 D-type female connector for PTZ control
	RS-485 or RS-422	1 RJ-45 connector for keyboard control or PTZ control
Setup	Local	On screen setup via keypad, I/R remote controller, and/or RS-485 keyboard controller
	Remote	Setup & upload via Windows application software
	Multi-lingual	Yes
Reliability	System recovery	Auto power on after power loss recovery
	Watch Dog Timer	Yes
	Timer	Built-in real time clock
	Dust filter	Industry-designed dust filter for harsh environments
	Security	Multi-level password protection with authentication key for remote access
Weights & Measures	Dimension Weight	430(W) x 330(D) x 88(H)mm 5.0 KG (without HDD)
Power	Source	90~264 VAC, 47~63 Hz
	Consumption	110W Max.
Operating Temperature		$0^{o}C$ ~ $+45^{o}C$

Appendix B – Structures Of Menu Displays



Appendix C – Time Zone Table

Time Zone	Offset	DST	Start	End
Samoa	GMT – 11:00			
Hawaii	GMT – 10:00			
Alaska	GMT – 09:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Pacific Time (US & Canada)	GMT – 08:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Arizona, US Mountain	GMT – 07:00			
Chihuahua, La Paz, Mazatlan	GMT – 07:00	ˇ	May, 1st Sun, 2:00	Sep, last Sun, 2:00
Mountain Time (US & Canada)	GMT – 07:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Central America, Saskatchewan	GMT – 06:00			
Central Time (US & Canada)	GMT – 06:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Guadalajara, Mexico City, Monterrey	GMT – 06:00	ˇ	May, 1st Sun, 2:00	Sep, last Sun, 2:00
Bogota, Lima, Quito, Indiana (East)	GMT – 05:00			
Eastern Time (US & Canada)	GMT – 05:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Atlantic Time (Canada)	GMT – 04:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Caracas, La Paz	GMT – 04:00			
Santiago	GMT – 04:00	ˇ	Oct, 2nd Sun, 0:00	Mar, 2nd Sun, 0:00
Newfoundland	GMT – 03:30	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Brasilia	GMT – 03:00	ˇ	Oct, 3rd Sun, 2:00	Feb, 3rd Sun, 2:00
Buenos Aires, Georgetown	GMT – 03:00	ˇ	Oct, 3rd Sun, 2:00	Feb, 2nd Sun, 2:00
Greenland	GMT – 03:00	ˇ	Apr, 1st Sun, 2:00	Oct, last Sun, 2:00
Mid-Atlantic	GMT – 02:00	ˇ	Mar, last Sun, 2:00	Sep, last Sun, 2:00
Azores	GMT – 01:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Cape Verde	GMT – 01:00			
Casablanca, Monrovia	GMT + 00:00			
Dublin, London	GMT + 00:00	ˇ	Mar, last Sun, 1:00	Oct, last Sun, 2:00
Western Europe, Central Europe	GMT + 01:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
West Central Africa	GMT + 01:00			
Eastern Europe	GMT + 02:00	ˇ	Mar, last Sun, 0:00	Oct, last Sun, 1:00
Cairo	GMT + 02:00	ˇ	Apr, last Fri, 2:00	Sep, last Fri, 2:00
Harare, Pretoria	GMT + 02:00			
Helsinki, Kyiv, Riga, Sofia, Tallinn	GMT + 02:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Jerusalem	GMT + 02:00	ˇ	Apr 1, 2:00	Oct, 2nd Sun, 2:00
Baghdad	GMT + 03:00	ˇ	Apr 1, 3:00	Oct 1, 4:00
Kuwait, Riyadh, Nairobi	GMT + 03:00			
Moscow, St. Petersburg, Volgograd	GMT + 03:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Tehran	GMT + 03:30	ˇ	Mar, 4th Tue, 2:00	Sep, 4th Thu, 2:00
Abu Dhabi, Muscat	GMT + 04:00			
Baku, Tbilisi, Yerevan	GMT + 04:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Kabul	GMT + 04:30			
Ekaterinburg	GMT + 05:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Islamabad, Karachi, Tashkent	GMT + 05:00			
Chennai, Mumbai, New Delhi	GMT + 05:30			
Kathmandu	GMT + 05:45			
Almaty, Novosibirsk	GMT + 06:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Astana, Dhaka, Sri Lanka	GMT + 06:00			
Rangoon	GMT + 06:30			
Bangkok, Hanoi, Jakarta	GMT + 07:00			
Krasnoyarsk	GMT + 07:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Irkutsk, Ulaan Bataar	GMT + 08:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Beijing, Chingqing, H. K., Urumqi	GMT + 08:00			
Kuala Lumpur, Perth, Singapore	GMT + 08:00			
Taipei	GMT + 08:00			

Time Zone	Offset	DST	Start	End
Osaka, Seoul, Tokyo	GMT + 09:00			
Yakutsk	GMT + 09:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Adelaide	GMT + 09:30	ˇ	Oct, last Sun, 2:00	Mar, last Sun, 3:00
Darwin	GMT + 09:30			
Brisbane, Guam, Port Moresby	GMT + 10:00			
Canberra, Melbourne, Sydney	GMT + 10:00	ˇ	Oct, last Sun, 2:00	Mar, last Sun, 3:00
Hobart	GMT + 10:00	ˇ	Oct, 1st Sun, 2:00	Mar, last Sun, 3:00
Vladivostok	GMT + 10:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Magadan, Solomon Is.	GMT + 11:00			
Auckland, Wellington	GMT + 12:00	ˇ	Oct, 1st Sun, 2:00	Mar, 3rd Sun, 2:00
Fiji	GMT + 12:00			
Kamchatka	GMT + 12:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Anadyr	GMT + 13:00	ˇ	Mar, last Sun, 2:00	Oct, last Sun, 3:00
Nuku'alofa	GMT + 13:00			

Appendix D – Keyboard Control Protocol

Data Format	5 Bytes – Byte 1 : Synchronization Byte (0xFF) Byte 2 : Address, i.e. Device ID (0 – 0xFF) Byte 3 : Code (see below) Byte 4 : Reserved (0x00) Byte 5 : Checksum (sum of Bytes 2 – 4)
Code	**Value (MSB set for key press, MSB reset for release)**
0 – 9	0x30 – 0x39 (ASCII characters '0' – '9')
*/mark	0x2d (ASCII character '–' – Minus sign)
#/code	0x3d (ASCII character '=' – Equal sign)
Alarm Reset	0x71 (ASCII character 'q')
MODE	0x77 (ASCII character 'w')
SEQ	0x65 (ASCII character 'e')
CALL	0x72 (ASCII character 'r')
SEARCH	0x74 (ASCII character 't')
REC	0x79 (ASCII character 'y')
Fast Backward	0x61 (ASCII character 'a')
Fast Forward	0x73 (ASCII character 's')
Single Step	0x64 (ASCII character 'd')
Play/Pause	0x66 (ASCII character 'f')
Stop	0x67 (ASCII character 'g')
Copy	0x68 (ASCII character 'h')
MENU	0x75 (ASCII character 'u')
ESC/PTZ	0x6f (ASCII character 'o')
MUTE/NEXT	0x6e (ASCII character 'n')
X2/GOTO	0x2c (ASCII character ',' – Comma)
▲/BS	0x69 (ASCII character 'i')
▼/DEL	0x6d (ASCII character 'm')
◄	0x6a (ASCII character 'j')
►	0x6c (ASCII character 'l' – small L)
ENTER	0x6b (ASCII character 'k')
Vol –	0x7a (ASCII character 'z')
Vol +	0x78 (ASCII character 'x')
–	0x63 (ASCII character 'c')
+	0x76 (ASCII character 'v')
MAIN-AUX ON	0x62 (ASCII character 'b')
MAIN-AUX OFF	0x70 (ASCII character 'p')
CALL-AUX ON	0x5b (ASCII character '[')
CALL-AUX OFF	0x5d (ASCII character ')')

Appendix E – Recording Table

Recording Time (in Hour) - For Reference Only (NTSC)										
System Storage (GB): 250										
Resolution	Quality	Average Picture Size (KB)*	Recording Rate (IPS)							
			480	360	240	180	120	60	30	15
720x480 (Full D1)	9	23.4					24.7	49.5	99	198
	8	16.2					35.7	71.4	143	286
	7	12.6					45.9	92	184	367
	6	8.0					72	145	289	579
	5	6.0					96	193	386	772
	4	5.0					116	231	463	926
	3	4.0					145	289	579	1157
	2	3.5					165	331	661	1323
	1	3.1					187	373	747	1493
720x240 (Half D1)	9	8.2			35	47	71	141	282	565
	8	7.0			41	55	83	165	331	661
	7	5.0			58	77	116	231	463	926
	6	4.0			72	96	145	289	579	1157
	5	3.2			90	121	181	362	723	1447
	4	2.8			103	138	207	413	827	1653
	3	2.2			132	175	263	526	1052	2104
	2	1.8			161	214	322	643	1286	2572
	1	1.5			193	257	386	772	1543	3086
360x240 (CIF) (CIF)	9	3.0	48	64	96	129	193	386	772	1543
	8	2.7	54	71	107	143	214	429	857	1715
	7	2.5	58	77	116	154	231	463	926	1852
	6	2.2	66	88	132	175	263	526	1052	2104
	5	2.0	72	96	145	193	289	579	1157	2315
	4	1.8	80	107	161	214	322	643	1286	2572
	3	1.4	103	138	207	276	413	827	1653	3307
	2	1.1	132	175	263	351	526	1052	2104	4209
	1	1.0	145	193	289	386	579	1157	2315	4630

*** Average Picture Size is estimated based on typical camera scene, and averaged by MPEG-4 I/P/B frames.**

Recording Time (in Hour) - For Reference Only (PAL)										
System Storage (GB): 250										
Resolution	Quality	Average Picture Size (KB)*	Recording Rate (IPS)							
			400	300	200	150	100	50	25	12.5
720x576 (Full D1)	9	30.4					22.8	45.7	91	183
	8	21.1					32.9	65.8	132	263
	7	16.4					42.3	85	169	339
	6	10.4					67	134	267	534
	5	7.8					89	178	356	712
	4	6.5					107	214	427	855
	3	5.2					134	267	534	1068
	2	4.5					154	309	617	1235
	1	4.0					174	347	694	1389
720x288 (Half D1)	9	10.6			33	44	66	131	262	524
	8	9.1			38	51	76	153	305	611
	7	6.5			53	71	107	214	427	855
	6	5.2			67	89	134	267	534	1068
	5	4.1			85	113	169	339	678	1355
	4	3.6			96	129	193	386	772	1543
	3	2.8			124	165	248	496	992	1984
	2	2.3			151	201	302	604	1208	2415
	1	1.9			183	244	365	731	1462	2924
360x288 (CIF)	9	4.0	43	58	87	116	174	347	694	1389
	8	3.5	50	66	99	132	198	397	794	1587
	7	3.3	53	71	107	142	214	427	855	1709
	6	2.9	60	80	120	160	239	479	958	1916
	5	2.6	67	89	134	178	267	534	1068	2137
	4	2.3	75	101	151	201	302	604	1208	2415
	3	1.8	96	129	193	257	386	772	1543	3086
	2	1.4	124	165	248	331	496	992	1984	3968
	1	1.3	134	178	267	356	534	1068	2137	4274

*** Average Picture Size is estimated based on typical camera scene, and averaged by MPEG-4 I/P/B frames.**